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THE
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MAY, 1923

SOIL FERTILITY, SOIL EXHAUSTION, AND THEIR HISTORICAL SIGNIFICANCE

SUMMARY

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I

Soil Exhaustion and the Mineral Theory

For more than a century some agricultural writers have contended that there is danger of soil exhaustion. In their opinion, the danger is so great that no system of agriculture, even the most extensive, can be deemed wise unless provision is made for the complete restoration to the soil of all the elements removed in the crop. Judged by this standard, the systems of agricultural

exploitation of early historical periods must inevitably be condemned, for few replacements were consciously made, and no complete restoration of losses would take place by natural processes. The failure to conform to the standards of later knowledge cannot justly be made ground for reproach in the case of the farmers of the Middle Ages and of the early modern period; but agricultural writers who believe in the danger of soil exhaustion feel greatly concerned over the persistence of many old practices in pioneer countries. They criticize the pioneers in harsh language.

These critics maintain that serious and permanent injury was done to the soils of Europe during the Middle Ages and the early modern period, and that similar depletion is now taking place in all pioneer countries. If the fact of serious exhaustion could be established beyond reasonable doubt, the practices of pioneer farmers should be immediately revised. If, on the other hand, the apprehensions are unfounded or exaggerated, we may hope that progress in scientific knowledge will explain much in the systems of extensive agriculture that has been hard to reconcile with modern theory.

The doctrine of soil exhaustion first took shape in the latter part of the eighteenth century, when the humus theory of plant-nutrition was dominant. It was then supposed that plants derived their food from the organic matter in the soil, collectively designated as humus. Now, humus does play an important part in the process of nutrition of plants, tho it is not the primary source of plant food. The study of humus was of genuine practical importance and of some scientific value; but concentration of attention upon this portion of the soil, which is easily exhausted, gave exaggerated importance to the notion that the powers of the soil could be quickly and completely exhausted. The discussion

led to the formulation of the theory of statics by von Wullfen — first, in a letter written in 1815; finally, in a treatise published in 1847.[1] This theory rested upon the proposition that the organic content of the soil should be maintained at a definite level — in most instances, the level natural to the particular soil. The items involved in the fertility program of each cultural method were computed and a balance struck of presumed gains or losses in fertility. The treatises of Thäer and von Thünen abound in such computations. The details inevitably suffered from the deficiencies of chemical knowledge, but the larger aspects of the problems were handled sufficiently well to give them practical importance. This body of thought was largely confined to Germany, and its presence there probably exerted some appreciable influence upon the formulation of the results of the work in inorganic chemistry that was brought to such important conclusions in the period 1830–50.

The demonstration of the relation of the minerals of the soil to plant growth was not the work of any single man; the elements of the new doctrine were accumulated slowly by a number of workers. The task of generalization, however, fell to Justus von Liebig, a chemist endowed with unusual powers of creative imagination.[2] His temperament carried him at times beyond the data of science, and his errors were corrected only at the cost of acrimonious controversy. He neglected details that proved to be of the utmost importance. Other workers covered these points, but neither the French who had been his teachers, nor the English, many of whom he taught, endeavored to bring out a systematic theory of the chemistry of the nutrition of plants. Workers in

1. Thäer, A., Grundsätze der rationellen Landwirtschaft, revised edition (Berlin, 1880), p. 186.

2. Volhard, J., Justus von Liebig (Leipzig, 1909); vol. i, p. 35; vol. ii, pp. 315–317.

France, England, and Germany took up with vigor the task of critical revision and amplification, but the main body of doctrine was the work of the great experimentalist in organic chemistry.

This course of development was, on the whole, fortunate, for the new branch of science established itself rapidly upon the basis of a sound mass of well-tried experimental knowledge; but there were some disadvantages. Liebig's results were modified or amplified in many instances without any corresponding change in the broad generalizations formulated in his writings. His sweeping statements of principle were inevitably somewhat premature; they were hypotheses, rather than elaborately grounded conclusions. Impatience with the details of practical agriculture led him at times into serious errors. For him, the problem of nitrogen was solved when he made up his mind that plants derived their nitrogen from the air. The process of fixation was not adequately explained until the work of bacteriologists brought to a conclusion the studies begun in Liebig's day by the noted band of students at Rothamstead — the agriculturalist, John Bennett Lawes, and, the chemist, Henry Gilbert.

There is ground to believe that the doctrine of the exhaustibility of the soil contained errors of fact and exaggerations of statement. The conclusions drawn from the new chemistry were pushed to much greater consequence by Liebig than by Lawes and Gilbert at Rothamstead, and, altho their position may have been due in part to lack of interest in the general problem, similar reasons do not apply to later members of the staff. Many agricultural chemists in the United States also adopt a conservative position; they recognize the possibility of exhaustion without deeming it of great practical importance. The Bureau of Soils at Washington

has carried this tendency to the greatest extreme, maintaining that there is not sufficient depletion of the more important minerals to cause any diminution in fertility. They do not mean that yields may not decline if land is badly managed, but they contend that these adverse changes are not nutritive problems in the sense usually alleged. The minerals necessary are present, but have become unavailable to the plants.[3]

Liebig's explanation of plant growth rested upon four propositions: (1) that the nitrogen needed by plants was derived from the air; (2) that the plants utilized the mineral elements in inorganic forms; (3) that the amounts of minerals required by plants could be ascertained by analysis of the ash; (4) that plant growth would be directly proportional to the supply of the mineral least abundantly furnished by the soil.

Analysis of soil samples showed that some of the minerals essential to plant growth were present in very modest quantities, especially potassium, phosphorus, and lime. The new theory seemed not only to make the fertility of soils minutely calculable, but also to indicate a relatively brief period of productivity for most soils. Soil exhaustion thus became a corollary of the mineral theory as well as of the humus theory, and Liebig judged all agricultural practices in terms of their relation to the maintenance of the mineral content of the soil. Every system of agriculture that did not involve substantial returns of nutritive elements to the land was characterized as "spoliation," and the result declared to be ultimate exhaustion. The decay of Rome was attributed to the exhaustion of the soil.[4] The practice of agriculture in America and other pioneer countries was unsparingly condemned, and the systems then prac-

3. U. S. Bureau of Soils Bulletin 57, 1909. A Study of Crop Yields.

4. Liebig, J. von, Letters on Modern Agriculture, translated by J. Blyth (London, 1859), pp. 241, 242.

ticed in England and Europe were characterized as a "more refined species of spoliation, which at first glance does not look like robbery."[5] Scarce any system of culture then in vogue escaped his criticism.

Altho most agricultural writers are more restrained in language than Liebig, and many do not allude to the historical applications at all, the entire case is restated in the writings of the late Professor C. G. Hopkins of Illinois, without essential change. The historical applications are made both to the decay of Rome and to the danger of like decline in other countries. Hopkins thought that the fertility of the lowlands might be maintained by alluvial deposits from the hills and uplands. "Thus, moderate soil erosion is not an unmixed evil; and with no adequate return of mineral plant food, the bottom lands and sloping hill lands are more permanently productive (with legumes made prominent in the crop rotations) than are the level upland soils. It is doubtful if there has ever been a land on the face of the earth, where the same soil particles have been turned with the plow year after year, that has remained productive for two centuries, with no return of mineral plant food. Even in populous China there are many level upland areas, sometimes of a hundred square miles in extent, where no one lives; and the restoration of these areas has been called the 'Problem of China.'"[6]

Recently, the doctrine of soil exhaustion has been revived by economists: Professor Simkhovitch in this country, and Lord Ernle in England. Simkhovitch applies the doctrine to Rome, to medieval Europe, and, through one of his students, to China. Lord Ernle confines his attention to medieval England.[7]

5. Liebig, J. von, Letters on Modern Agriculture, translated by J. Blyth (London, 1859), p. 133.

6. Hopkins, C. G., Soil Fertility and Permanent Agriculture (Boston, 1910), pp. 62, 590, 591. See also, King, F. H., Farmers of Forty Centuries (Madison, 1911), pp. 279 ff.

7. Simkhovitch, V. G., Toward the Understanding of Jesus (New York, 1921). This volume includes two essays published previously in the Political Science Quarterly:

The historical applications of the doctrine of soil exhaustion raise two concrete issues: (1) the length of time within which complete exhaustion of minerals would take place under the methods of agriculture commonly practiced in Europe prior to the nineteenth century; (2) the importance to practical agriculture of partial depletion of the original stock of minerals. These problems will now be considered.

II

The Life Table of a Normal Soil

Analyses of the ash from plants, together with soil analyses, afford a means of computing the probable duration of the supplies of minerals in the soil. The tables given below are both recent, but they present practically the same material that Liebig had in mind when he made his criticisms of current agricultural

"Rome's Fall Reconsidered," and "Hay and History." The thesis has also been applied to the research problems of two of Professor Simkhovitch's students: Miss Harriet Bradley and Miss Mabel Ping Hua Lee. Miss Bradley's study, "The Enclosures in England," makes soil exhaustion the controlling factor in the early enclosures. Miss Lee's study, "The Economic History of China," brings in the thesis incidentally, but in ways which do not always seem apposite.

The articles by Lord Ernle, "The Enclosures of the Open Field Farms," in the Journal of the Ministry of Agriculture (Dec., 1920, Jan., 1921), are not available at the time of writing. The specific allegations of declining yields in England have been subjected to searching criticism by R. S. Lennard, "The Alleged Exhaustion of the Soil of Medieval England," Economic Journal, March, 1922, vol. xxxii, p. 12. There is no evidence of decline in yield. It should be recognised, however, that it is impossible to secure conclusive evidence for periods prior to the most careful and sustained keeping of records. Mr. Whitney, in the Bulletin of the Bureau of Soils cited above, contends that it is necessary to secure continuous data for not less than forty years in order to obtain a figure for an average yield that shall be free from the influence of climatic variation. The Rothamstead figures bear similar testimony to long periods of relatively high and relatively low yields.

Until the experiment stations have run continuous tests over long periods of time, we can do no more than consider probabilities with regard to the influence of failure to make a complete replacement of the strategic minerals.

Variations in climate have been the subject of many studies by Ellsworth Huntington: "Civilisation and Climate" (New Haven, 1915); "Principles of Human Geography," in collaboration with S. W. Cushing (New York, 1922); "Climatic Change and Agricultural Exhaustion as Elements in the Fall of Rome," Quarterly Journal of Economics, xxxi, pp. 173–208. The conclusion that there have been important variations in climate is hardly open to further doubt.

practice. The first table, prepared by Hopkins, is based upon the average composition of the earth's crust. It affords a significant basis of reference in the study of particular soils, but it is not as well adapted to our present purpose as the second table, which gives the stocks of various minerals in a "normal" soil. To this normal soil is assigned the stock of each mineral that would

TABLE I. — RELATIVE SUPPLY AND DEMAND OF SEVEN ELEMENTS [8]

Essential elements	Pounds in 2,000,000 lbs. of soil	Pounds in 100 bu. corn (grain only)	Number of years supply
Phosphorus	2,200	17	130
Potassium	49,200	19	2600
Magnesium	48,000	7	7000
Calcium	68,800	1.25	55,000
Iron	88,600	0.5	200,000
Sulphur	2,200	0.25	10,000
Nitrogen in air	70 million lb. over an acre	100	700,000

TABLE II. — MAXIMUM NUMBER OF CROPS THAT COULD BE PRODUCED BY THE QUANTITY OF EACH OF THE PRIMARY PLANT FOOD ELEMENTS IN AN ACRE FOOT OF NORMAL SOIL [9]

Crop	Yield per acre	Nitrogen	Potassium	Phosphorus	Sulphur	Calcium	Magnesium
Corn	50 bu. grain and stover	80	860	133	172	2182	1875
Wheat	25 " " " straw	133	1765	200	171	4800	4300
Oats	45 " " " "	162	882	168	200	3200	3000
Red clover hay	2 tons	75	500	160	100	533	882
Alfalfa hay	3 tons	45	600	115	70	373	625
Potatoes	200 bu., 2 tons tops	136	500	177	160	6860	3750
Apples	300 bu., 2 tons leaves	111	550	266	400	470	1000

8. Hopkins, C. G., op. cit., Table 8, p. 59.

9. Fippin, E. O., Outline of the Function and Use of Commercial Fertilizers. Cornell Extension Bulletin 8, December, 1916, p. 8.

commonly be present in fair agricultural land, neither the best nor the worst.

These tables indicate clearly the critical importance of nitrogen and phosphorus. In practice, sulphur seems to be less important and lime much more important than the figures in the tables indicate. Since the mechanism of the relation of atmospheric nitrogen to plants has been understood, it is admitted that nitrogen need not be a serious factor in the limitation of crop development on most soils. The minerals are more likely to be a source of difficulty, and of the group, phosphorus and lime are most critical. For reasons which will be discussed later, lime is not ordinarily regarded as the decisive factor in the life of the soil, that distinction being conferred upon phosphorus. The life table of the soil thus runs primarily in terms of phosphorus.

According to the table, 200 full crops of wheat could be produced, or somewhat fewer crops of the other products, excepting only apples. There is a temptation, indicated by the statement of Hopkins cited above, to translate these 200 crops directly into a term of years; but this can be done only by neglecting the assumptions upon which the computations are based. Careful regard to these assumptions will do much to explain the continuous practice of agriculture in Europe since the Roman occupation.

Medieval agriculture was based upon fallowing; in alternate years or every third year the land was cultivated without crop. In the earlier period, too, land was frequently allowed to revert to wild grass and to remain for twenty or thirty years without crop. It is safe to assume that the cultivated land was not under crop more than one half or one third of the time. The period of possible wheat culture would thus be extended by one hundred or two hundred years.

The calculations with regard to the number of crops are based upon the relation of the minerals removed in the crop to the stock of minerals in the soil. Some specific amount of crop must be assumed; and in the calculations given above "full" crops were used as the basis of the computation. The amounts specified are considerably greater than the average now harvested in the United States and very much more than was harvested in the Middle Ages. R. S. Lennard has collected figures from English sources for eighteen separate years in the fourteenth century indicating an average yield of 7.5 bushels per acre.[1] Estimates by Miss Bradley and N. S. B. Gras are not significantly different. The precise degree of modification proper as an allowance for differences in the crops must rest upon conjecture. Crops were somewhat larger in the early modern period, but over any large area they hardly exceeded twelve bushels prior to the nineteenth century. The period of possible culture might thus be extended to as much as three times the period suggested in the table.

There is further uncertainty in respect to the depth of soil from which plants draw nutritive minerals. The figures given relate to the surface soil only: six and two thirds inches in Table I; one foot, in Table II. This top soil is probably the chief factor in the direct nutrition of shallow-rooted plants; but under usual drainage conditions the deeper-rooted plants draw upon a much larger area. "When the root-feeding zone," says Professor Fippin, "is maintained at three feet by good drainage, the figures for the mineral elements are tripled, which defers almost indefinitely the absolute exhaustion of any of these elements from the root zone."[2] It is not quite correct to assume that the

1. Lennard, R. S., "Alleged Exhaustion of the Soil in Medieval England," Economic Journal, vol. xxxii, pp. 22, 23.

2. Fippin, E. O., Outline of the Function and Use of Commercial Fertilizers. Cornell Extension Bulletin 8, December, 1916, p. 83.

mineral content of the soil is uniform to a depth of three feet; but the margin of error in this respect is not large. There is, however, some little controversy in regard to the significance of the subsoil to plant growth.

A technique for the study of the rooting habits of plants has recently been developed, which has been used by Ten Eyck and Packard in this country and by Rotmistrov at Odessa. Packard's studies of alfalfa are for semi-arid conditions and probably should not be called in question. Commenting upon the results of Ten Eyck and Rotmistrov, Duggar says: "The roots of winter grain often extend laterally and vertically to a distance of over forty inches. Winter rye was found to extend to a greater depth, and winter wheat to a greater extent laterally, than other small grains." In respect to corn, especially in the western United States, the majority of the lateral roots lie in the zone between three and twelve inches from the surface, and tho the laterals send branches downward, one must presume that the surface soil is of relatively greater direct importance than the subsoil.[3]

The subsoil, however, may be of importance to the plants in somewhat less direct ways. The movement of the soil solution by capillary action must certainly be of moment, tho it is not now possible to make any quantitative statement of the extent of the contribution to the feeding zone of the top soil. It is likely, too, that there is sufficient displacement of the subsoil by earthworms and burrowing animals to be of moment. Darwin found that earthworms brought new soil to the

3. Duggar, B. M., Plant Physiology (New York, 1911), pp. 41–45. The citation is at p. 43. The rooting habits of alfalfa in the Imperial Valley, California, were largely determined by the level of the water table. When the water table was relatively high, 54.8 per cent of the roots were in the first foot of soil: when the water table was deeper, roots penetrated in significant masses to a depth of five feet, especially in cases of wisely applied irrigation water. University of California, Experiment Station Bulletin 284, September, 1917, pp. 73-75.

surface at the rate of 0.2 to 0.22 inches per year. On a field near Darwin's house, a layer of soil seven inches deep was brought up by worms in twenty-nine years. The depth from which these soil particles are brought is not readily ascertained. Much of the life of the worm is passed in the top soil, but their burrows extend three or four feet below the surface, and this deeper burrowing is essential to their life in dry spells during the summer as well as during dormancy in winter. Even if the subsoil is not the chief contributor to the castings, it must participate in this persistent movement of the soil.[4]

It is clearly impossible to reach any exact appreciation of the extent of the contribution made by the subsoil in these various ways, tho it is equally evident that this portion of the soil cannot be ignored when long periods of time are under consideration. In order to have concrete figures, let us assume that the entire subsoil contributes merely as much as the surface foot. The period of possible culture would in that event be extended an additional two hundred years.

The computations for wheat culture under the earlier conditions attain the proportions indicated below.

PHOSPHORUS LIFE-TABLE FOR A NORMAL SOIL UNDER LIGHT CROP, ASSUMING NO RETURNS OF MINERALS

Stock of phosphorus in the surface foot	200 years
Allowance for fallowing	100 to 200 "
Allowance for light crop	400 "
Allowance for contributions from the subsoil	200 "
Total years of possible culture	900 to 1000 "

These results are distinctly more in accord with the actual agricultural history of Europe than the statements of the exhaustionists of the extreme type. At the

4. Darwin, Charles, The Formation of Vegetable Mould through the Action of Earth Worms (New York, 1882), pp. 103, 110, 143 ff.

worst, conditions would have remained more or less within the bounds of possible culture up to 1800. In this connection, too, there is a significant statement by Russell. "Serious soil exhaustion did not arise under the old agricultural conditions, where the people practically lived on the land and no great amount of material had to be sold away from the farm. Phosphate exhaustion was the most serious occurrence because there was no way of meeting it, and, as the original supplies were not as a rule very great, it must have been acute by the end of the eighteenth century in England, for remarkable improvements were, and still are, effected all over the country by adding phosphates. Then began a process, which has gone on to an increasing extent ever since, of ransacking the whole world for phosphates, even the old battle fields not being spared, if we may believe some of the accounts that have come down; later on (in 1842) Henslow discovered large deposits of mineral phosphates, to which more and more attention has been paid. Phosphate supplies may yet become the factor that will determine the course of history." [5]

In view of the newer standards of crop that have come to dominate our conceptions of intensive agriculture, it is not clear that one would be justified in deeming the profitable use of phosphates *prima facie* evidence of phosphorus exhaustion in the sense in which we have been using the term. But the explicit reference to the close of the eighteenth century indicates a wide difference from the opinion of the extreme exhaustionists.

The opening sentence of Russell's statement is of special moment. All the computations of the exhaustionists assume that no returns whatever were made to the soil. Tho it may be possible to find instances of practices of this sort on the present agricultural fron-

5. Russell, E. J., Soil Conditions and Plant Growth, fourth edition (London, 1921), pp. 320, 321.

tier, the assumption is not justifiable with reference to medieval agriculture. Trade in the primary food products, during the Middle Ages, involved the displacement of relatively small proportions of the product of individual farms. The large cities drew their supplies of cereals and meat from areas that were large in proportion to the actual movement of goods. The small towns and villages secured their supplies in their immediate neighborhood. Small quantities of farm-yard manure were available to the medieval farmer, and some household waste found its way back to the land. Some phosphorus was restored in these ways. Much phosphorus was restored through the decomposition of the bones of farm animals and of the cattle or sheep that were killed in the fall for lack of winter forage.

Medieval life resulted in much less displacement of materials than modern life. Man was more nearly a part of the life cycle dominated by nature. The equilibrium among the various forms of life that tends in nature toward conservation was not profoundly disturbed. Thus, without conscious thought on the part of the farmer, there was some measure of replacement — how much, we cannot say. Upon the basis of studies made upon his own farm, von Thünen came to the conclusion that the three-field system would maintain the fertility of the soil unimpaired, if there were as many cattle kept as was proper, and the amount of pasture were properly adjusted to the area under arable crops. Thäer, writing somewhat earlier, believed that there was some loss of fertility under three-field agriculture. Whatever the merits in the controversy, we may presume that there was some significant measure of replacement of fertilizers under three-field agriculture. Both of these writers were thinking in terms of organic matter rather than crude minerals, but recent work has placed organic

matter in such an important light that such a form of replacement would be, if anything, the most desirable.

It is impossible to suggest any mathematical allowance for the amounts of the replacements that may have taken place, but it is not necessary. The restoration of any portion of the minerals as a regular feature of the cultural system completely changes the character of the computation. When it is assumed that no minerals are restored, we have to deal with a terminable series; the systematic return of some of the minerals makes the process of use an infinite series. Absolute exhaustion would thus be impossible, tho depletion might of course be carried to such a point that practical agriculture would be unprofitable.

III

The System of Statics and the Mineral Theory

Liebig maintained that the growth of plants was directly proportionate to the stock of minerals least abundantly supplied by the soil. He presumed that soil analysis was a direct index of fertility, tho some qualifications were present in his mind. This thesis, applied to the problems of practical agriculture, led to the assumption that the yield of crops would decrease in proportion to the depletion of minerals. As the rate of depletion was directly proportionate to the mass of the crop, yields could ordinarily be maintained only by constant replacement of minerals.

"With each crop, each plant, or portion of a plant taken away from the field," says Liebig, "the soil loses a portion of its fertility; that is, it loses the power of again producing this crop, plant, or portion of a plant, after the expiration of a number of years of cultivation. A thousand grains of corn require from the soil a thou-

sand times as much phosphoric acid as one grain; and a thousand straws, a thousand times as much silicic acid as one straw: if, therefore, there is a deficiency of a thousandth part of the phosphoric or silicic acid in the soil, then the thousandth grain and straw will not be formed. A single corn straw removed from a corn field, makes this field bear one corn straw less." [6]

The only disturbing factors Liebig recognized are the unequal distribution of the minerals through the soil, and the condition of the soil with reference to penetration by the roots of the plants. Fallowing, in his opinion, would postpone for a time the actual decline of yields, but only for a relatively short time. All this was in keeping with the system of statics in vogue in Germany in Liebig's day, so that the mineral theory gave new vitality to principles of agricultural practice that had grown up in connection with the "humus" theory of nutrition.

It was at first supposed by many that it would be desirable to add as fertilizer "complete" combinations of minerals and nitrogenous substances. Prepared chemical fertilizers of this type are still a conspicuous feature in the market. Commercial fertilizers usually include nitrogen, phosphorus, and potash; in the experiments at Rothamstead, soda and manganese were also used. At present, however, there is a distinct tendency to adopt a more highly specialized fertility program. Hopkins, notably, advises against the use of complete manures. "For practically all of the normal soils of the United States," he says, "and especially for those of the Central States, there are only three constituents that must be supplied, in order to adopt systems of farming that, if continued, will increase, or at least permanently maintain, the productive power of

6. Liebig, J. von, Letters on Modern Agriculture, translated by J. Blyth (London, 1859), pp. 115, 116.

the soil. These are limestone, phosphorus, and organic matter. The limestone must be used to correct acidity where it now exists or where it may develop. The phosphorus is needed solely for its plant-food value. The supply of organic matter must be renewed to provide nitrogen from its decomposition and to make available the potassium and other essential elements contained in the soil in abundance, as well as to liberate phosphorus from the raw mineral phosphate naturally contained in or applied to the soil." [7]

A more generalized statement is made by A. D. Hall, formerly director of the station at Rothamstead. "Several examples have already been given," he says, "to show that the greater the amount of fertilizer added to the soil the smaller is the proportion returned in the crop; these are only particular cases of the general rule that the wastage of nitrogen is greater, the higher the fertility of the soil. Fertilizers go less to feed the crop directly than to maintain the level of fertility of the land, and as this rises, all the actions which result in loss of nitrogen are increased at a rapid rate. Thus, the intensive farmer often becomes wasteful because, after his land is in good heart, he continues to add fertilizers at the same rate as he did when he was building up its condition.

"It therefore follows that an account of what is removed from the soil year by year by the crops or animals raised upon the farm provides very little guidance towards determining the amount of fertilizer which must be brought in; at a low level of production, good land will practically recuperate itself without any extraneous manure, while relatively high farming for big crops involves a considerable wastage of nitrogen applied to the land and never recovered in the crop. It is only by

7. Hopkins, C. G., op. cit., p. 159.

experience, by the knowledge of his own land and the market conditions which prevail, that the individual farmer can tell how high it is profitable for him to farm, and therefore to what degree he can utilize the information as to feeding his crops which is provided by field experiments." [8]

Neither of these writers, therefore, accepts the static theory as the basis of his fertility program. Hopkins' recommendation has reference to a specific group of soils, and may thus be reconciled with his more sweeping statements on exhaustion. The passage from Hall assumes the principle of relativity of culture that was urged by von Thünen and assumed by the classical school of economists. It explicitly denies the validity of the premises of the static system both for high farming and for farming with no manure except that produced on the place. Under such circumstances, the replacement is probably somewhat less than complete. The experiments at Rothamstead include continuous culture of many crops without any fertilization. The cereals respond significantly, even under these rigorous conditions, tho barley and oats are less sturdy than wheat. After decline in the second and third decades, the yield of wheat becomes stabilized and as yet does not show further recession that may not, in view of yields on other plots, be ascribed to variation in rainfall. There must be some depletion of the minerals, so that these field-results demonstrate conclusively the possibility of culture without the steady decline in yield that would be implied by the reasoning of static writers.

Comparison with yields on other plots, wheat alternating with fallow and wheat in rotation, shows that the decline in the crop for the first three periods was due to the gradual decline of the stocks of nitrogen. Plots

8. Hall, A. D., Fertilisers and Manures (New York, 1920), pp. 305, 306.

fertilized with complete minerals also show marked declines, on account of the deficiency in nitrogen. When allowance is made for these factors, there is no evidence of decline that can be traced to the depletion of minerals.

TABLE III. — YIELDS OF WHEAT AT ROTHAMSTEAD
PLOT 3, UNMANURED, WHEAT EVERY YEAR[9]

Average for years	Grain bushels per acre	Straw cwt. per acre
1844–51	17.2	15.5
1852–61	15.9	15.2
1862–71	14.5	11.5
1872–81	10.4	8.5
1882–91	12.6	8.5
1892–1901	12.3	9.1
1902–11	10.9	9.6

The studies of E. W. Hilgard in the cotton belt of the United States, tho made from a different point of view, lead to the same conclusion. By checking chemical and mechanical analyses with local field experience, he reached the conclusion that certain proportions of lime, phosphorus, and potash must be present to afford assurance of a fertile and enduring soil. The amount of lime requisite varies, in his opinion, from 0.25 per cent in clay loam to as much as 2 per cent in heavy clay. The percentages of phosphorus and potash that are needed vary both with respect to the amount of lime present and in accordance with the texture of the soil. The extreme range of variation is large. Many soils, extending over substantial areas, contain stocks of minerals in excess of the amount thus ascertained as requisite to assure culture for a long period of years without addition of minerals and without likelihood of decline in yield.[1]

The full explanation of these complex phenomena will

9. Hall, A. D., The Book of the Rothamstead Experiments, second edition, revised by E. J. Russell (New York, 1917), p. 36.

1. Hilgard, E. W., Report on Cotton Production in the United States, pp. 56, 57, 61–66; Census, 1880; Cotton Production, vol. i.

probably be afforded by the studies of the soil solution which are now making notable progress. These newer developments of the science constitute one of the most important modifications of Liebig's views. He failed to appreciate the exact character of the process by which the minerals of the soil reach the plant. In his opinion, plant growth was not affected by the soil solution, but only by direct contact between the roots and the particles of the soil. This is now known to be an erroneous view, tho it is true that the nutritive influence of the minerals in the soil is highly localized. Plants are sustained by the soil solution in the immediate vicinity of their roots. The amount of nutrition that they will receive is determined by the concentration of the solution and by the rate at which it is renewed when partially depleted. Neither the original concentration nor the rate of renewal is directly proportionate to the amount of minerals in the soil.

This was demonstrated by some tests conducted at one of the experiment fields of the California Experiment Station. Fertilization experiments were being planned for an orange grove, and, tho the land seemed to be substantially uniform, it was decided to run a test on the whole area by growing the trees under uniform conditions for a few years. Notable differences appeared. Soil analyses were made, but without revealing any differences commensurate with the differences in growth. The soil solution was then withdrawn from selected areas around the trees, and the time required for its renewal closely observed. There were wide variations in the rate, which corresponded closely with the differences in growth that had been observed.[2]

The newer school of agricultural chemists is thus moving toward dynamic concepts of soil phenomena that involve a complete departure from the essentially

2. Communicated to the writer by W. P. Kelley of the Station staff.

static concepts of Liebig. Instead of defining fertility in terms of mineral content, it is now deemed essential to consider the "condition" of the soil, in respect to compound particles and their colloidal properties; the mass and condition of the organic matter in the soil; the microörganic population of the soil, consisting of algae, fungi, actinomyces, and protozoa; and lastly, a number of conditions that are unfavorable to plant growth by reason of some toxic action on the plant itself, or on some of the bacteria essential to the plant as mediators between the crude materials of the soil and the substances that can actually be used by the plant in its manufacture of food. The soil solution is likely to be the expression of the total effect of all these interacting factors. When all conditions are favorable, modest stocks of minerals may afford adequate nutrition to plants, and conversely. "Some of the most fertile soils in England are not particularly rich in plant nutrients, but they are able to keep the roots well supplied." [3]

Recent work thus affords an abundant prospect of an ultimate explanation of continued culture under diminishing supplies of particular minerals, even of such critical minerals as phosphorus. Our conception of the relative importance of the depletion of minerals is also affected. The minerals are important, but other things are important too, most particularly the system of tillage and the handling of the organic matter, both that originally in the soil and that created by culture. If the condition of the soil is well maintained, the failure to add phosphorus in proportion to the phosphorus removed seems much less serious to the modern scientist than it seemed to Liebig. Our sense of relative value has changed perhaps as much as our knowledge of facts has increased.

3. Russell, E. J., Soil Conditions and Plant Growth (London, 1921), p. 239. The enumeration of factors in fertility is from Russell.

Depletion of potassium presents substantially the same problem as phosphorus. On most soils, potassium is less likely to be the limiting factor in plant growth than phosphorus. The general supply of potassium is larger and it becomes available only gradually, so that serious wastage does not occur. Availability of potassium is increased by culture and notably by reactions established by the use of the nitrate of soda.

There is little likelihood of the depletion of other minerals to an extent sufficient to affect practical agriculture; but the conditions affecting the development of nitrates and the relations of lime to plant growth produce fertility phenomena of the utmost importance to the present discussion.

The decline in yield in frontier countries, which leads to the abandonment of old fields for new, is most frequently due to changes affecting the supplies of nitrogenous compounds to plants or to the development of acidity in the soil. There is a loss in fertility, for the time being, but it is not a condition of exhaustion in the sense of the irreparable wastage that is implied by the critics of early agricultural methods.

The relatively large stocks of nitrogen found in virgin grass land or forest will be replaced by natural processes after they have been drawn down by arable agriculture. "On the Broadbalk field," says Mr. Russell, "a third plot adjacent to the two already mentioned was in 1882 allowed to go out of cultivation and has not been touched since; it soon covered itself with vegetation, the leaves and stems of which go to enrich the soil in organic matter. The gain is very marked, as shown in the table. The gain is much influenced by the amount of calcium carbonate in the soil, and is considerably less on another plot in Geescroft field where only little calcium carbonate is present: whether this is

due to any specific action, or to the changed physical conditions brought out by a decalcifying soil, is not clear. Gains of nitrogen also take place on land covered with perennial grasses and clovers, even when the crop is mown or grazed."

GAINS IN NITROGEN IN SOILS PERMANENTLY COVERED WITH VEGETATION. RUN WILD 22–24 YEARS

Broadbalk Field: $CaCO_3$, 3.32 %

	Per cent carbon		Per cent nitrogen	
	1881	1904	1881	1904
1st 9 in.	1.14	1.23	.108	.145
2d 9 in.	.62	.70	.070	.095
3d 9 in.	.46	.55	.058	.084

Geescroft Field: $CaCO_3$, 0.16 %

	Per cent carbon		Per cent nitrogen	
	1881	1904	1881	1904
1st 9 in.	1.11	1.49	.108	.131
2d 9 in.	.60	.63	.074	.083
3d 9 in.	.45	.44	.060	.065

Land laid down to grass in 1856 and mown annually
Dr. Gilbert's meadow

	1856	1879	1888	1912
Per cent of nitrogen in 1st 9 in. (estimate)	.152	.205	.235	.338

"But the gain in nitrogen does not go on indefinitely; in the course of time a point of equilibrium is reached, higher or lower according to soil conditions, where further gains are balanced by losses, so that the nitrogen content remains constant. Unfortunately on our present knowledge it is impossible to maintain a high content of nitrogen on cultivated land except at a wasteful expenditure of nitrogenous manure." [4]

The utilization of the nitrogen in virgin soils by the pioneer can thus work no injustice to later generations.

4. Russell, E. J., Soil Conditions and Plant Growth, pp. 113, 114.

Unless there is a physical loss of soil through erosion, succeeding generations will find a land covered with vegetation, and provided with nitrogenous compounds equivalent in amount to the stock of the earlier period. It is misleading to describe the land as "exhausted," because at that moment it no longer *pays* to grow arable crops under pioneer conditions.

Lime presents a different problem. Some calcium is doubtless required by most plants as nutritive substance, but it is becoming steadily clearer that the importance of lime is not restricted to direct nutrition. By processes that are not clearly understood, many soils under culture develop acid reactions beyond the limit of tolerance of some of the important plants.[5] The legumes are especially sensitive to acidity of the soil, and, by reason of their importance in nitrogen fixation, acidity becomes a limiting factor of the utmost moment. This condition, however, arises only in part through depletion of lime; and, whatever the precise source of the difficulty, for practical purposes it is a physical or toxic rather than a nutritive problem. Lime must be present in the soil, not merely with reference to the feeding needs of the plant, but also in sufficient measure to neutralize the "acids" formed during culture. Soils naturally abundant in lime seldom need treatment; but many soils that are otherwise fertile are not sufficiently supplied with lime to keep the soil in neutral condition, and in such cases agriculture soon becomes impossible unless lime is added.

The Volusia silt soils of New York, Pennsylvania, and Ohio exhibit this feature of the fertility problem on a commanding scale. Large areas in these states are covered by soils of this type, and they have played a considerable part in the agricultural history of the

5. Russell, E. J., Soil Conditions and Plant Growth, pp. 109–118.

region. On many of these soils the yields have declined until culture is unprofitable. The difficulty is a matter of drainage, acidity, and tilth. Study of these soils is summarized as follows by a bulletin of the Bureau of Soils.

"When these soils were first cleared and in their virgin state, the physical condition was favorable for the successful growing of many different crops; but with the continuous cropping to which they have been subjected, the methods of farming followed, and the systems of management practiced, the physical condition has changed, and is now to a large extent unfavorable to the same crops.

"Flocculation of the soil grains seems to be entirely lacking, and consequently the puddling and baking of the surface takes place easily. A granular structure and its attending effects would facilitate desirable and beneficial moisture movements, aeration, and oxidization, all of which are necessary for the production of even ordinary yields of our farm crops. Such structure should be obtained by proper drainage, liming, and the incorporation of organic matter." [6]

The University of Notre Dame took over a 1000-acre farm in northern Illinois which had been under cultivation for eighty years. In its virgin state, this soil had produced good crops, but yields declined — first of clover, then of other crops. Corn yields fell to 25–30 bushels in the best years, and in the worst years the crop was a total failure. The addition of lime proved to be the most important regenerative measure.[7]

These cases are merely an index of the conditions that are a result of pioneer agriculture in the United States.

6. Carr, M. Earl, A Preliminary Report on the Volusia Soils, their Problems and Management. U. S. Bureau of Soils Bulletin 60, pp. 7–13 (citation from p. 13).

7. University of Illinois, Experiment Station Circular 186. The Illinois System of Permanent Fertility, pp. 4, 5. The instance is cited to show the value of rock phosphate, but it is better proof of the need of lime.

Material exists to show the importance of acidity on many common soil types of the coastal plain, which were of course first brought under culture.[8] Some soils were well supplied with lime, but many were not, and these latter developed serious problems. The use of lime began in the latter part of the eighteenth century in this country, but was not general. Unfortunately, too, the use of lime is not sufficiently simple to admit of certain success with purely empirical methods. Thoro scientific knowledge is essential to the best use of this amendment. In Europe, the use of lime began at an early date, but with dubious results as long as its application was purely empirical. In general, however, the problem of acidity had been met in Europe before the opening of the nineteenth century.

It would carry us beyond the scope of the present subject to discuss the relation of lime to disease, but it is important to bear in mind this aspect of liming in any complete statement of the problems of the fertility program.

Modern scientific knowledge would enable a pioneer farmer to amend his practices in many respects. Without prohibitive costs, more attention could be given to the utilization of organic residues. Liming might prove to be less costly than the making of new clearings. Better judgment might be shown in the management of clay soils. Science may be a benefit to the pioneer no less than to the intensive farmer. Because it reveals some possibilities of improvement, science inevitably furnishes ground for criticism of many agricultural practices. But it is steadily becoming clearer that science affords no basis for the static concept of the fertility program. The calculation of the minerals re-

8. Census of 1880, vol. iii, Agriculture; Report of Mr. Killibrew on Tobacco Culture, passim.

moved by the crop does not furnish a certain or adequate guide to fertilization. For high farming it may be necessary to add much more of some elements than is removed: low farming may be justified in limiting its fertility program to the maintenance of nitrogen and organic matter. The modern farmer, too, is not primarily concerned with the maintenance of the "original" powers of the soil; his problem is to modify the natural soil in accordance with his needs. This treatment of the fertility program is consistent with the law of the minimum, broadly conceived; but it is not in accord with the system of statics that Liebig took over from the agricultural writers of his day. His harsh criticisms of the earlier systems of culture did not rest upon an assured basis of scientific facts.

Abandonment of the static concept of the fertility program necessarily involves abandonment of the historical applications of the doctrine made by Liebig, Hopkins, Simkhovitch, and Lord Ernle. Some depletion of minerals doubtless occurred, but its effect upon practical agriculture can scarcely have been as serious as they supposed. We have no early soil analyses, nor any adequate data on early crop yields for Italy, England, or any country; and, in view of the complexity of agricultural phenomena, it is hazardous to discuss the problems of ancient Rome and medieval England in the light of general principles. We can explain, in a measure, the persistence of cereal culture in Europe throughout the medieval period, but we are certainly in no position to attempt exact appraisal of the extent or the practical significance of depletion of minerals in European soils.

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INTERNATIONAL RIVALRY AND FREE TRADE ORIGINS, 1660–78

SUMMARY

Trade a party issue after the Restoration, 412.—Fear of French commercial rivalry, 413.—Concern about the state of English trade, 416.—Fortrey on "England's Interest and Improvement," 418.—Mun on "England's Treasure," 421.—Alarm at the success of Colbert's policies, 423.—Prohibition of French imports, and reasons for its lapse, 425.—Continued fear of French competition, 428.—Chamberlayne on "England's Wants," 430.—Reynel on "The True English Interest," 432.—Prohibition of trade with France, 433.—Conclusion, 434.

In his notable study "The Tory Origin of Free Trade Policy"[1] Sir William J. Ashley has pointed out that, among the important problems of the late seventeenth century, which supplied the young political parties in England with the nourishment of disagreement, was that dearest of party issues — the tariff. Not long after the Restoration, Court and Country parties found themselves at odds over many questions. Religious differences were still vital; new "party material" appeared in varieties of constitutional and political views; and from the sphere of economic thought and policy, eager partisans drew a novel and potent weapon, the balance of trade. Intrenched in the profits of the British East India Company, the Country party found itself assailed by arguments about the dangers of bullion export and unfavorable foreign exchange. In opposition to their Court party opponents, therefore, the defenders took refuge in the development of balance-of-trade ideas.[2] To

1. Ashley, William J., "The Tory Origin of Free Trade Policy," Quarterly Journal of Economics, vol. ii (July, 1897), pp. 335–371.

2. Usher, A. P., An Introduction to the Industrial History of England (Boston, 1920), pp. 280 ff. The East India Company found it convenient to change its politics, so

meet this new position the Court party worked out the theoretical advantages of free trade. From a liberal standpoint, the future Tories could thus score against their enemies who were hampered by the restrictions necessarily imposed by any attempt to maintain a theoretical or practical balance of trade.

To the advantage of the Country party, or Whigs, must be reckoned the concurrence of their balance-of-trade arguments with the facts of French political power and commercial competition. They could raise the cry of "unfavorable balance" against any royal or Tory favor shown toward France. Their first success in this direction was the great "Prohibition of French Trade," in 1678. From this period, Ashley definitely traces the growth of the Tory Origin of Free Trade Policy. Behind this partisan impetus for the development of a new doctrine, however, lies a considerable period of economic tendency strongly nationalist in character. In this period it would appear that the English acquired an active consciousness of the dangers of French competition, and that this sense of national hostility to France had a profound influence in determining the position which English political parties assumed with reference to economic theory and policy.

During the régime of the Commonwealth, English trade had expanded greatly, and about the time of the Restoration it became clear to Englishmen that there had been a similar expansion on the French side of the Channel. In 1661 came Colbert to give system, direction, and vision to the energies of France. His far-reaching plans for the creation of a greater state, in which all efforts should tend to the production of power,

that the positions of the political parties with reference to the company's interests were reversed, the Tories defending and the Whigs attacking. The situation was influenced, Usher holds, more by personal and constitutional considerations than by conscious thought of the merits of free trade or protection.

were based upon economic conceptions. Inasmuch as the sources of economic power, according to prevalent mercantilist ideas, were static, what one country gained another lost. Colbert was not the doctrinaire he has often been pictured, but theory and ambition combined to convince him that, if France could conquer and absorb the economic resources of the Dutch, his efforts for the organization and strengthening of French trade and industry would succeed immeasurably. For him the Dutch represented economic greatness.[3] Much as he appreciated English energy and "business methods," he failed to see that England, and not Holland, was the economic state of the future, the real rival for France. Very quickly, on the contrary, the English came to realize that the Dutch were not as formidable as the French, and placed their enmity where it would yield them, in the long run, the best results.

International hostility, therefore, aggravated by economic rivalry, played an important rôle in developing that English party divergence which was ultimately expressed in tariff and free trade theories. Mr. D. G. E. Hall has recently given us an excellent study, "Anglo-French Trade Relations under Charles II,"[4] showing particularly the conditions of English manufactures and trade confronted by strong French competition. It appears that as early as 1660 there is a vigorously expressed uneasiness among English commercial and industrial activities. An insistent complaint already indicates sensitiveness to the unfavorable balance of the French trade; there is apprehension because of the quantity of English wool exported to France and Hol-

3. Masan, J. de., Les Doctrines economiques de Colbert (Paris, 1900), pp. 33 ff.; Mims, S. L., Colbert's West India Policy (New Haven, 1912), pp. 198 ff.; Lettres, Instructions et Mémoires de Colbert (Paris, 1861–82), passim, esp. vol. ii, pt. 2, p. 658; vol. iii, p. 67; vol. vi, pp. 264–266.

4. Hill, D. G. E., "Anglo-French Trade Relations under Charles II," History, vol. vii, No. 25 (April, 1922), pp. 17–30.

land, and the consequent decay of the English manufacture; there is displeasure at the number and amount of French commodities consumed in England, and a general distrust of the growing power and suspected ambitions of the French nation. In March, 1660, Sir George Downing writes from the Hague to the President of the Council [5] that "upon examination, I do find that there are daily great quantities of English wool brought from England to this country . . . and truly, unless something be by Parliament very speedily done, in Relation to the woolen manufacture of England: as this country hath already in a manner wholly gotten the manufacture of fine cloth, so this country and Silesia will between them divide also the manufacturing of coarse cloth, and England have nothing left but the growth of its wool." The sense of this injury was deepened by the action of the Dutch in placing heavy duties on English cloth and woolen manufactures; whereat the House of Commons, September 4, 1660, petitioned His Majesty "that by treaty or otherwise, the Dutch be got to take off the heavy impositions . . . whereby our cloth trade is much discouraged." [6] These grievances, plus increased French competition, led to a proclamation of September 15, 1660, prohibiting English raw materials from being exported to Jersey and Guernsey, and withdrawing all licenses for this trade. Parliament also passed an "Act for prohibiting the exportation of Wooll, Woollfells, Fullers Earth or any Kind of Scouring Earth." [7]

Toward the close of 1660 it became apparent that,

5. Smith, J., Chronicon Rusticum-Commerciale, or, Memoirs of Wool, & Being a Collection of History and Argument Concerning the Woolen Manufacture and Woolen Trade. . . . (London, 1747), 2 vols.; vol. i, p. 202.

6. Calendar of State Papers, Domestic Series of the Reign of Charles II (London, 1860–1915), 1660, vol. xiv, p. 225.

7. 12 Car. II, c. 32. Characterized in Macpherson, Annals of Commerce, Manufacturing, etc. (London, 1805), vol. ii, p. 489, as "the first legal act for the express and general prohibition of the exportation of wool by English subjects."

underlying the complaints against the poor condition of the cloth trade and the undue export of wool, there was a general depression for which the government should undertake some remedy.[8] In response to a remonstrance from Exeter regarding the obstructions to the cloth trade, the House of Commons was inspired, November 8, 1660, to order [9] "that this information be referred to the Committee for Trade: which is hereby revived." Meanwhile, on the previous day, the Council had issued instructions directing the members of the Council of Trade [1] to deliberate on any injuries arising to English trade from non-observance of treaties with foreign powers, and on any decay or corruption in some manufactures, and to suggest redress; also they were to consider the best means to improve native commodities, to regulate the fisheries, the *balance of exports and imports*, matters relating to navigation, bullion supplies, foreign plantations, and so on.[2]

A month later, December 12, 1660, the Council presented to the king a suggestion which, considering its date in connection with Ashley's thesis concerning the partisan origin of such ideas, is unexpectedly early. The Council proposed [3] that the king should "withdraw the penalties on the export of gold and silver, as injurious to trade, by preventing English merchants from bringing their money into the kingdom, where it would be detained, and inducing them to lodge it, instead, at Amsterdam or Leghorn." Moreover, the reasons stated for

8. Hall, p. 19. Cf. Petition of shopkeepers and artisans showing the damage to trade by the import of woolens, laces, ribbons, etc. Cit. C. S. P., 1660, November 24.

9. Commons Journals, vol. viii, p. 178. This committee was afterward merged with that dealing especially with the woolen manufacture. Ibid., vol. viii, pp. 178, 179, 180, 182, 183.

1. C. S. P., 1660, vol. xxi, p. 353.

2. It is interesting to note the use of this phrase three years before it was employed by Samuel Fortrey in his book which gave it currency — England's Interest and Improvement. It was not until 1673 that this book became widely read.

3. C. S. P., 1660, vol. xxiii, p. 411.

this proposal are to the effect that the past laws on this subject have been futile; they were enacted for a different state of trade from that in which England now finds herself, and *it is important to leave trade "to act in its own natural mode."* Examples of other countries are cited where trade enjoys freedom from restraints on exports. Such freedom is important especially for the East India Company and for the Turkey Company.[4]

There are other instances, of the closing days of 1660, which illustrate the agitation of English commerce.[5] On December 13, the Council for trade informed the king that "as the matter relating to trade, woolen manufactures, etc., concerns the whole kingdom, they advise the issue of a proclamation stating the grounds and powers of the Commission of Trade, and inviting any person concerned therein . . . or who have any petition, or invention to offer, to apply to them for redress of evils brought on by the late times, or for the improvement of the trade regulations."[6] Finally, it is to be noted that in this same year, 1660, came a reëdition of the Navigation Laws, in commenting upon which, Macpherson observes that the French were beginning to invade Newfoundland and despoil the English of valuable fishing possibilities.[6a]

During 1661 wool was exported, despite the prohibition, in large quantities.[7] Constantly increasing inroads were made by the French upon the English market and the effect is apparent in the proclamation issued November 20, 1661, commanding enforcement of the acts

4. At this time, 1660, it is to be observed that the politics of the Companies were chiefly "Whig," and this liberalism toward trade is not in accordance with the point of view attributing the whole source of free trade origins to the Tories.

5. C. S. P., 1660, vol. xxiv, p. 428. The weavers company of London petitioned the king for authority for members of their body "to search for and seize prohibited goods imported by French and others, who, anticipating measures being taken against them, when more urgent affairs permit, are bringing in quantities of such goods."

6. Ibid., 1660, vol. xxiii, p. 411. 6a. Macpherson, vol. ii, pp. 490, 491.

7. C. S. P., 1661, vol. xliii, p. 80, September 2. An Exeter merchant received from St. Malo the information that "wool is brought here in as much abundance as if it were

which prohibited the import of laces, fringes, ribbons, gloves, hats, knives, painted wares, etc.[8] Soon after, the House of Commons was aroused to action once more, resolving, February 26, 1762, that a committee be appointed to prepare and bring in sumptuary laws, and laws to prevent "incroachments in Trade by the Jews and the French, or any other foreigners. . . . And all merchants of this House are added to the committee." [9] Many of the numerous suggestions reported by this committee were subsequently embodied in the improvements and extensions of the Navigation Laws.[1] These encroachments of French enterprise which were causing so much jealousy in England were not without reasonable cause. Macpherson calls attention to the fact that it was during this year, 1662, "as Voltaire explains in his Age of Louis XIV, that the French Royal Council of Commerce was created, that the king himself presided therein once in every fortnight. Need we to wonder, then, at the position that nation has since made in commerce, so eminently encouraged by so discerning and potent a prince." [2] Behind this potent prince was Colbert; it was his energy and comprehensive plans which were beginning, thus early in his career as a royal official, to make themselves felt even in England.

In the tract of Samuel Fortrey, on "England's Interest and Improvement," published in 1663,[3] we have a

freely transported. Four vessels laden with it have just come from Ireland; they were entered to unload at Dover, and probably obtained there false certificates of the landing of the wool. If these things pass, we may bid adieu to the sales of English drapery. The French petition their king that it may not be brought into Normandy, since they make it as well as the English." Cf. also, Macpherson, vol. ii, p. 500 and C. S. P., 1661, vol. li, p. 294. Other merchants and clothiers of Exeter, as well as of other English towns, are loud in their complaints of these conditions; they are particularly put out at the "company monopolizers" or the merchant adventurers for their conduct of foreign business. One "monopolising company did in all transport but 225 pieces of woolen goods from mid-summer to Michelmas, 1661; yet five or six Exeter merchants not free of the company, did within the same quarter of a year buy and export beyond sea 9254 pieces."

8. C. S. P., 1661, vol. xliv, p. 153. 9. Commons Journals, vol. viii, pp. 441, 467, 468.

1. Ibid., p. 467. 2. Macpherson, vol. vii, p. 506.

3. Edition of 1673 reprinted, McCulloch, J. R., Select Collection of Early English Tracts on Commerce (London, 1856), pp. 211–254.

clearly articulate expression of contemporary appreciation of French competition. The tract is presented as a "professed translation" of a "particular not long since delivered to the king of France," to the effect that the English trade with France is at least sixteen hundred thousand pounds a year clear loss to this kingdom of France. By way of constructive suggestion to the English, Fortrey points out that the great desideratum of the present time is an "increase of store and trade." Acquisition of such is to be most surely attained through populousness. Successful increase of population is to be brought about by giving foreigners the right of domicile, freedom to trade, and freedom to establish themselves comfortably in every way. It is true, Fortrey admits, that "considering our present condition, how trade is decayed, and the little encouragement people have to industry, we have already more people than are well employed." But this situation can be righted by striking at the root of commercial decay, which really consists in the vast sums spent annually in the consumption of French commodities. A greater home consumption of English manufactures must be encouraged, for which the king and court should set an example. Great care must be devoted to the stimulus of foreign trade, and consideration taken of what to import and what to export. Foreign manufactures must be kept out as much as possible by heavy duties, but not by prohibitions.[4] The drain of bullion caused by an overimportation of foreign commodities *cannot be prevented by laws*. They are fruitless in such a case. It is only by the "right ordering and disposing of our trade" that our exports may be brought to exceed our importations.

4. In his opposition to prohibitions, Fortrey was not alone. Similar warnings against them are to be found in Brewster, Sir F., Essays on Trade and Navigation (London, 1695), p. 41, and in Petyt, Sir William, Britannia Languens (London, 1680), reprinted in McCulloch, p. 487.

It is Ashley's view [5] that there is no evidence that Fortrey's pamphlet met with much acceptance at the moment of its publication, in 1663. Not until ten years later, he holds, did the popular agitation against France create a market for these ideas, and then Fortrey found so many people desirous of reading his tract that he reprinted it. It is perhaps true that this pamphlet, with its celebrated estimate of the overbalance, was not extensively cited for some ten years after its publication. But it is decidedly not the case that the idea of overbalance and the supposed dangers therefrom was quiescent until taken up by the Whigs, in the late seventies, as a party weapon. Twelve years before the great prohibition of 1678 the growing sentiment on this subject caused the House of Commons to undertake a prohibition of French trade — a prohibition quite unreckoned, apparently, in Ashley's interpretation of the significance of that of 1678.

Between 1663 and 1666 the industrial and commercial depression continued to call forth complaints similar to those which have been noted above. Bills were discussed in Parliament regarding the prohibition of the export of bullion, and the usual remedies for the encouraging of manufacturing and commerce were submitted.[6] An act was proposed for the increase of trade by permitting merchants to pay for commodities by bonds or bills, instead of by selling debts due them, and by binding over merchant strangers to expend on exports all the money they received for imports, and to bring from abroad money to pay the imposts on their imports. None of these proposals came to anything. During 1664, however, English public opinion was urgently directed to observe the dangers of an over-

5. Op. cit., p. 340.

6. C. S. P., 1663-64, vol. lxxix, p. 245.

balance of trade. Then appeared the posthumously published tract by Thomas Mun, — the classic statement of the balance-of-trade theory, — "England's Treasure by Forraign Trade." [7] The appearance of this important treatise, and the attention which it received, show clearly that this subject did not remain obscure until 1678.[8] In general, Mun's statements are not so alarmist as those of Fortrey; he does not attempt to carry the conviction that England is on the verge of ruin from overbalance. But Mun does endeavor to establish clearly and emphatically the theory that a favorable balance of trade is absolutely "the rule of England's treasure."

It is essential, Mun argues, that the importation of foreign goods, especially those that have to do with clothes and diet, be diminished. Manufactures must be increased in quantity, and exported and sold abroad as "dear as the high price cause not a less vent in the quantity." To increase the very desirable trade with distant countries, he advocates in this, as in his pamphlet on the East India trade, the benefits to be derived from the export of bullion. His balance-of-trade theory removed all the evils consequent upon the mere export of the precious metals. "Moneys exported will return to us more than trebled. . . . It is not then possible but that all the overbalance or difference should return either in money or in such wares as we must export again, which as is already plainly showed will be a still greater means to increase our treasure. . . . It is not . . . the keeping of our money in the kingdom, but the necessity and use of our wares in forraign countries, and our want of their commodities that causeth the vent and

7. Reprinted, McCulloch, pp. 116–209.

8. Cf. the frequent references to Mun's tracts in the numerous pamphlets of this period. An interesting letter by Sir Richard Ford to Mun indorsing his ideas, is printed in C. S. P., 1663–64, vol. xcv, March 22, 1664, p. 525.

consumption on all sides which makes a quick and ample trade." [9]

There is little doubt that Mun's contribution either reflected a fairly general sentiment developing among mercantile interests, at this time, or was a factor in stimulating such a sentiment. Contemporaneously, at any rate, with the appearance of this pamphlet there was an unusual manifestation of the liveliest dissatisfaction with the conditions of trade, a tendency to attribute the cause to French competition, and a conviction that the remedy lay in preventing an overbalance of trade. During 1664 the clothiers of the "old and new Draperies" petition the House of Commons against the export of wool,[1] and at the same time, the committee of the Council for Trade ordered representatives from the merchant companies to lay before them, on April 1, an account of the causes of obstruction in their several trades, together with proposals for remedies.[2] Meanwhile, the committee received a petition from the masters of ships and mariners "to consider and redress the loss sustained by the kingdom through the decay of shipping and mariners, owing to the engrossing of the trade to France by Frenchmen, who

9. The essence of Mun's position is contained in his final injunctions: "Let the merchants' exchange be at a high rate, or at a low rate, or at the Par pro pari, or put down altogether; let Forraign Princes enhance their coins, or debase their standards, and let his Majesty do the like, or keep them constant as they now stand; let Forraign coins pass current here in all payments in higher rates than they are worth at the mint; let the Statute for employments by strangers stand in force or be repealed; let the meer Exchequer do his worst; let Princes oppress, Lawyers extort, Usurers bite, Prodigals wast, and lastly let merchants carry out what mony they shall have occasion to use in their traffique. Yet all these actions can work no other effects in the course of trade than is declared in this discourse. For so much treasure only will be brought in or carried out of a Commonwealth as the Forraign Trade doth over or under ballance in value. . . . So that all other courses (which tend not to this end) howsoever they may seem to force mony into a kingdom for a time, yet are they (in the end) not only fruitless but also hurtful."

1. C. S. P., 1663–64, vol. xcv, p. 526. Complaint against the export of wool — "as much is conveyed away in obscure places . . . and workmen also set up the manufactures elsewhere, whereby the markets abroad are well supplied, to the damage not only of themselves, but of the trading companies, and the kingdom in general."

2. Smith, Memoirs of Wool, vol. i, p. 213, takes Mun sharply to task for his too optimistic view of the export of wool. He holds that conditions were very bad.

came to England during the late troubles, and for the incorporation of the merchants trading to France." [3] As Macpherson remarks, in his analysis of conditions during 1664, England was beginning to feel the effects of Colbert's régime.[4] "Colbert, the able minister of France, now began to put in execution his deep-laid schemes for the advancement of the commerce, manufactures and naval power of that kingdom, the foundation whereof had been laid by the great Richelieu. . . . He got the king to appropriate a million of livres annually for the improvement of the woolen manufacture alone; and it is generally believed that it was owing to Colbert, that the mischievous practice of running our own English and Irish wool into France (vulgarly called owling) was first set on foot; whereby they gradually brought forward their present great woolen Manufacture."

It was indeed Colbert and French economic activity which was making the balance-of-trade theory popular in England. The French overbalance was spreading conviction. At this time (1664) Colbert imposed the first of his celebrated tariffs, dealing partly with the circulation of domestic trade, but also imposing higher duties on foreign importations.[5] It is noteworthy that

3. C. S. P., 1662–64, vol. xcv, p. 572.

4. Op. cit., p. 515.

5. Lettres, Instructions et Mémoires, vol. ii, p. 831. Droits d'entrée de diverses marchandises venant de Hollande et d'Angleterre.

	Avant 1664			Tariff de 1664			Augmentation en 1664		
	L.	*s.*	*d.*	*L.*	*s.*	*d.*	*L.*	*s.*	*d.*
Bas de soye	2	7	3	0	15	0	2	0	0
Bas d'estame, la douzaine	2	10	6	3	10	0	3	0	0
Bayette d'Angleterre (pièce de 25 aunes)	4	14	0	5	0	0	10	0	0
Bayette double (pièce de 50 aunes)	9	9	4	15	0	0	30	0	0
Draps demy-Angleterre (pièce 9–10 aunes)	3	8	8	4	10	10	10	0	0
Draps d'Angleterre (pièce de 25 aunes)	36	17	4	40	0	0	80	0	0
Frise seche d'Angleterre (18 aunes)	2	9	0	3	0	0	7	0	0
Frise d'Angleterre (13 aunes)	1	0	0	1	10	0	3	0	0
Molletons d'Angleterre (25 aunes)	4	15	0	6	0	0	12	0	0
Serge d'Ecosse	1	19	4	2	0	0	4	0	0

these increases fell heavily upon English industrial products. On the 3rd of August of this year, also, the first session of the new Conseil de Commerce, organized somewhat earlier by Colbert, was held in the presence of the king.[6] In the program presented by Colbert, we find a comprehensive exposition of his plans for building up the strength of France. His efforts to encourage the textile industry are enlightening as a factor in the relations of England and France. The tariff of 1664 is one of the influences which led straight to the English prohibition of 1666. Between these two dates there is a constant increase of English opposition to the trade with France.

During this period a project was submitted to the Council by Sir S. Crow, "for a great addition to the wealth and common stock of our nation, by thrift in making more use of our own commodities and abstaining from foreign commodities."[7] Trade was "very dead" and money scarce in 1665, according to the correspondence between Viscount Conway and a certain Henry Carter. "Bold and frequent exportations of sheeps' wool, yarn, fulling . . . continue to damage England's industries" and build up those of her rivals.[8] Trade in the port of London and at other ports was reported by customs officials as very low;[9] money was hard to borrow, and the woolen trade much decayed. Under these circumstances, Parliament was once more aroused to action — really important, this time. On September 22, 1666, the Commons resolved that a committee be appointed to "consider of Proposals to be tendered to the House, for Advance of the manufactures

6. Neymarck, A., Colbert et son temps (Paris, 1877), vol. i, Appendice; vol. iv, pp. 344–361. Cites in full the minute presented by Colbert. From Collection of Duc de Luynes, MSS. No. 93, C. 4.

7. C. S. P., 1664–65, vol. cix, p. 147. 8. Ibid., vol. cxxvii, p. 478.

9. Ibid., vol. clix, pp. 447, 459.

of this nation, and to prevent Excess in using Foreign Manufactures and commodities." [1] Sir George Downing presented the committee's report on the 8th of October; and in simplest terms, its findings aver that the responsibility for the present state of things rests with France and the French trade. To meet this condition, the committee proposes the absolute prohibition of French importation.[2] The House at once authorized the drawing up of a bill to this effect; the king was to be addressed with reference to a proclamation and the concurrence of the Lords was requested.

The zeal of the Commons in passing these measures obviously cannot be laid wholly to their solicitude for the grievances of merchants or manufacturers, or to the cogency of the balance-of-trade arguments. Even a subservient English parliament, of this period, possessed plenty of religious and political antipathy to France. At the moment particularly, the Commons, whatever might be the attitude of Charles II, would be hostile to France and very suspicious of the aims of the king. In January (1666) Louis XIV had announced his alliance with the Dutch in their conflict with England, and considered himself at war with the English. The Anglo-French phase of the war amounted to little in a military or naval sense, and it was chiefly in the economic sphere that the English vented their feelings.

Affairs of state were not favorable for Charles II at this time, for, as the *Memoirs of Wool*[3] pithily describe the circumstances, ". . . the King's Affairs were in an ill situation. The King of France publishing a Declaration of War against England, in a sea engagement (with

1. Commons Journals, vol. viii, p. 626. The committee is to meet in the Speaker's chambers and to "send for Persons, Papers and Records; and they are to consider of Expedients for Increase of the Stocks of Money in the Nation." The report is largely a statement of the grievances and difficulties accumulating since 1660.

2. Ibid., p. 632.

3. Smith, op. cit., vol. i, p. 215.

the Dutch) the English lost 23 great ships; and soon after, a terrible Fire in London laid a great part of the City in Ashes. No wonder, if all these together, added to the under-Balance of Trade, gave an extraordinary Damp, so as [to] reduce the Price of things extremely low." It was some time, however, before the committee to draft the bill prohibiting the importation of French goods reported to the House. By January, 1667, the bill was ready. In the meantime, the proclamation had been resolved upon by a vote of both the Houses, and an address prepared requesting the king to issue his prohibition of the French trade.[4] The deputation addressing the king reported back that "His Majesty very chearfully accepted of said votes; and declared, He would take a speedy course therein." [5] In this instance, at least, "His Majesty" was as good as his word, and on November 10 appeared a proclamation [6] forbidding the import or sale of all sorts of commodities of French growth or manufacture "after 1 December next." Following this date, there was much confusion among merchants and manufacturers, who found themselves in difficult straits, with French goods on hand, but without opportunity to land or market them in England.[7] The Calendars of State Papers, Domestic, through 1666–67 and into 1668 contain many petitions and dispensations regarding the application of this prohibition.[8] Exactly when its effectiveness lapsed is not apparent.[9] There is

4. Commons Journals, vol. viii, pp. 637–639, 644.

5. Ibid., p. 644 (2 November, 18 Car. II).

6. C. S. P., 1666–67. Printed Proclamation Collection, p. 236.

7. Hall, p. 22. Statistics provided by Houblon, Papillon, and other important London merchants were laid before Parliament, showing that English exports to France were less than those of France to England by no less a sum than £965,128 17*s.*, 4*d.* per year. Cit. Parl. Hist., Appendix CXV. Cunningham, W., English Industry and Commerce, Modern Times, p. 458.

8. C. S. P., 1667–68.

9. Cf. Cambridge Modern History, vol. v, p. 921. The prohibition may have lapsed in March, 1667, when Charles was secretly negotiating with Louis XIV.

no mention of the subject in the treaty of Breda, as might perhaps have been expected, altho there may have been an informal understanding. Charles II was preparing the way for his secret alliance with Louis XIV, and to avoid the opposition of the Commons, as well as to remove an obstruction from the path of a good understanding with the French, the king may have quietly allowed the prohibition to lapse. This is probable, because the way of the rapprochement with France had been smoothed by considerable discussion of a commercial treaty between the two countries.[1] Colbert apparently intended to seize the opportunity afforded by the diplomacy of his master to secure a very advantageous commercial arrangement with England.

An outline of Colbert's plans, evidently drawn up at his dictation by the French ambassador in London, indicates that he hoped for virtual reciprocity in trade.[2] Considering the state of commercial opinion in England at this time, it is not difficult to imagine the divergence of royal and mercantile aims with respect to such a treaty. During the discussions of this treaty plan occur the last general references to the prohibition of 1666. Efforts to secure the treaty were revived some six or seven years later but were not wholly successful.[3] The bill enacting prohibition, so eagerly taken up by the House, was referred back to a committee and the matter gradually sank out of sight.[4] The chief legislative result

1. Hall, pp. 22, 23. Cf. later discussion of this treaty in 1672.

2. Lettres, Instructions et Mémoires, vol. ii, pp. 803–831. Project de Traité de Commerce entre la France et l'Angleterre . . . avec quelque notes de Colbert. Dated 2 Oct. 1669; contains 58 articles: No. 2, Liberté reciproque d'entrer et de trafiquer dans tous les ports et rades . . . aux deux couronnes dans l'Europe; No. 6, Reduction de droits de port et d'entrée sur le mesme pied qu'ils estoient le 25 dec. 1664. Cf. also L. I. M., vol. ii, p. 492, a letter of Colbert to Croissy, French ambassador at London, commenting on the proposed treaty. Ibid., pp. 588 and 618 for statements by Colbert regarding the English prohibition. A memoir, ibid., p. 825, dated 1671, indicates that both British and French governments hoped to exchange high tariffs for the abolition of prohibition.

3. C. S. P., 1668, p. 341. Cf. Hall, pp. 22, 23.

4. Commons Journals, vol. viii, p. 678. Read January 17, 1666, and January 22.

of all this activity was apparently the "Act for Burying in Woollen onley." [5]

No relief, however, seems to have been felt at this time from the long-standing difficulties in trade, the export of wool, the unfavorable balance of trade and the decay of the cloth industry. Needless to say, the discussion of these matters did not lapse.[6] The motives for prohibition of French goods remained strong and constant during the whole period from 1668 to 1678. There is no reason to suppose, with Ashley,[7] that adequate motives do not begin to appear until about 1673. As we have already seen, the bogey of "overbalance" is beginning to be much discussed; it is certainly well known long before Ashley credits its effective appearance in the much-cited "Scheme of the Trade, As it is at present carried on between England and France," appearing in 1674. Overbalance was a familiar spectre during the 1660's. The surprising feature is that it did not sooner become a party issue.[8] There is no break, from 1666 on, in the sequence of evidence which shows that the attempted first prohibition met a real demand in England, and that the second of 1678 was but an extension of the same causes.

5. 18 and 19 Car. II, c. 4. Cf. C. S. P., 1668, July 11. Cit. Hall, p. 21.

6. Commons Journals, vol. ix, p. 15. Commons on November 4, 1667, appointed a committee to consider the damages to trade, to consider "how the ballast of trade may be made even" and how to discourage the wearing of foreign clothes, and how to prevent the export of wool.

7. Op. cit., p. 343.

8. There are numerous sources of information which indicate that in the period immediately preceding the publication of the "Scheme of Trade" (1674), emphasized by Ashley as a turning-point in the attitude toward the balance of trade, there was ample sentiment for producing a prohibition. Cf. for example, the petition of the Weavers Company of London to King and Commons, stating their grievances, of eight years' standing, against foreign silks, laces, etc. C. S. P., 1673, p. 304. Or the "Address to all gentlemen, apprentices and journeymen . . . acquainting them that we are impoverished by foreign nations, especially by the French trading with England." Ibid., 1670, p. 176. Also a letter to the Navy Commissioners from an English captain at Leghorn, stating that "the French are now the blades which bear away the belle in trading." Ibid., 1670, pp. 285 ff.

On the 13th of November, 1667, the House of Commons having received a report from Sir John Knight on the means for settling and balancing of trade between England and Scotland, resolved [9] "that Wednesday and Friday morning of each week, from Ten of the clock, be set apart for the House to resolve into a Committee of the Whole House, to take into consideration the *general balance of Trade:* and in particular the settling the balance of trade between England and Scotland."

It must be noted that it was in this same year, 1667, that Colbert made his second great attack on the competition of foreign industry. This was in the form of a heavy tariff doubling or even more highly increasing the duties of 1664.[1] The English government met this challenge by raising the duties on the importation of wines.[2] But this did not affect the zeal of Colbert. He had calculated that such policies of her rivals could not harm France, and his conclusions appeared, at least temporarily, to be justified; for this was the period when his efforts were bringing their best results. Between 1667 and 1678, roughly, Colbert accumulated that stock of possibilities and power which Louis XIV so lavishly wasted in the years to follow. Of this success some Englishmen were appreciative. Their laments were numerous and insistent.[3] But the king took no heed, and as his policy was chiefly directed toward making himself independent of Parliament, there was little opportunity of action by the Commons. In 1670 he made his alliance with Louis XIV, and was willing to assist the French in crushing Holland and advancing Catholic in-

9. Commons Journals, vol. ix, p. 20.

1. Lettres, Instructions et Memoires, vol. ii, p. 831.

2. C. S. P., 1668, p. 285.

3. Macpherson, vol. ii, pp. 532 ff. Cf. also, Locke, J., Some Considerations of the Consequences of the Lowering of Interest and Raising the Value of Money (London, 1692); Ward & Locke, reprint, p. 598.

terests in England. It was when the consequences of these secret arrangements became manifest, in the Act of Indulgence of 1672, that the most significant aspect of real party opposition begins. It was yet six years to the time when the Whigs came to realize the political advantage of the balance-of-trade doctrine. But there was even now ample reason for British distrust of France. The policy of Charles II practically subordinated England to the interests of Louis XIV, under whose strong centralization France menaced much of Europe with subjection.

This France of Louis XIV and Colbert suggests several interesting parallels with the Germany of William II. To many contemporary Englishmen it caused alarm. The organization, efficiency, and system of Colbert were impressive and portentous things, not agreeable to the English mind.[4] The great military machine of Louvois and Vauban, with its remarkable training and discipline, with its engineers and impregnable fortresses, was coordinated by a network of splendid roads and canals, strategic as well as economic. The all-embracing plans of Colbert, bringing every aspect of national life under the scrutiny and direction of a hard-working bureaucracy, characterized in the main by high intelligence and zeal and permeated by the consciousness of loyalty to their great king, gave force and effectiveness to the ambitions of "le Grand Monarque."

An uncomfortable appreciation of French superiority in this concentration of power is reflected in several English writings expressing the desirability of similar activity in England. Of such an opinion is Edward Chamberlayne, author of the curiously visionary tract, "England's Wants or Several Proposals Probably Bene-

4. Macaulay, T. B., History of England (ed. Firth), vol. i, pp. 282 ff.; Hertz, C. B., English Public Opinion after the Restoration (London, 1902), pp. 98 ff.

ficial for England." [5] He advocates "a great public stock, as in neighbor nations," for carrying on, by the state, of public relief or social service, for making rivers navigable, for the building of bridges, highways, seabanks and harbors; for setting up youths after apprenticeship; for marrying poor maids; for erecting banks; for stipends for physicians and surgeons; for educational institutions; in general, for a paternalistic system under which things should be done "as in Paris."

Another Englishman writes, from France in 1670,[6] regarding the treatment of English textiles by the French government, and reports that the Intendant Pelletier has informed the drapers that "la commerce aujourd 'huy en France est une matière d'estat." In respect to this dictum, the Englishman remarks, "I wish His Majesty of England would consider how much the banishing our English Manufactures from the French dominions is matière d'estat in that court. . . . Strangers, I find far more thrifty than we, and they have many pleasing inventions which we are not addicted to, and by making so many new fabrics, the French fabrics are in greater estimation than many of ours. . . . I fear that we are not so diligent as our neighbors." [7] Tracts begin to appear [8] in the early 1670's on this text; and in 1672

5. The edition in the library of Harvard University bears on the title page, "2nd edition, 1668." The catalogue of the British Museum does not refer to the first edition, but indicates one of 1689, with the title "England's Wants, or Several purposes very advantageous for England."

6. C. S. P., 1670, p. 601.

7. Yet another Englishman writes from St. Malo to his home correspondent (ibid., 1672, p. 1): "It is worth your noticing the diligence of the French to carry on their trade. I wish they make us not the cat's foot." A correspondence between English traders, in 1672, recounts (ibid.) that "a Falmouth man from New Haven and Havre complains the French use him harder now than before, and that divers bragged that after they had Holland, they hoped to have England." Similar anxiety is evident in a letter of the Bishop of Lincoln, written in the same year: "Holland deservedly suffers all the miseries it now lies under, but if it submits to France, where are we? I am persuaded France will treat and conquer on till there be little left to treat for" (ibid., p. 264).

8. Slingsby Bethel published a tract in 1671 on the "Present Interest of England," wherein he remarks (p. 38): "Should France, by the acquisition of those convenient Provinces and Ports of the Netherlands become competitors with England in Trade (to

negotiations were renewed with reference to a commercial treaty with France which might possibly equalize the balance of trade;[9] but the French were dilatory, and in spite of earnest pressure brought to bear by those interested, in England, no real results were obtained.

By 1673 the tide of English opposition to France and the overbalance of French trade had risen to full vigor, and the Whigs began to assume the championship of the Balance theory. The new edition of Fortrey's pamphlet was published to meet a popular demand. But there are other printed views which show more fully the character of French influence. Carew Reynel published in 1674 "The True English Interest, or an Account of the Chief National Improvements in some Political Observations." Attacking, as Fortrey does, the dangers of overbalance, Reynel goes further and surveys the general condition of England and compares it with that state of France which Colbert had brought about. After defining the terms of national wealth, the value of trade, husbandry, enclosures, and so on, he deals at length with what he deems "the chief national improvements." Following Colbert, he advocates the undertaking of every variety of economic activity, the construction of canals, the minute regulation of labor and unemployment, technical training for industry, and the regulating of marriage with a view to "populacy." Between

say no worse of them), they would, in a short time, make good Sir Walter Rawleigh's Character of them, in being false, insolent, and covetous neighbors." Another tract by one "W. C." on "England's Interest by Trade Asserted" (printed, 1671), harps on the well-worn theme of the damage wrought by the illicit export of wool. He cites letters showing that the French are making a low price "sort of Cloath" called serge de Berry which is driving the English out of the market. This is corroborated by letters in the C. S. P., 1670, pp. 600 ff., written from Lierre in France. "Whereas we usually furnished the French, for clothing for their soldiers, with a coarse sort of light grey cloth, Colbert obliged all the infantry to be clothed with a cloth called Serge de Berry, made about Rouen . . . but it is not to be made without English wool, and unless it come to hanging for wool stealing . . . we shall lose the reputation of our fabrics."

9. Hall, pp. 22 ff. In 1673 the London weavers caused a riot by attacking the French weavers domiciled in London and destroyed their materials and wrecked their houses. C. S. P., 1675, August 10–11. Cit. Hall, p. 24.

Reynel's pamphlet and the well-known "Parfait Négociant" of Jacques Savary there is a considerable resemblance. Both were published in 1674. The French book is a monumental work, ostensibly written as a textbook for prospective merchants, a guide to every phase of trade. But it is more than a commercial handbook. It is an embodiment of the conceptions of Colbert for the economic development of France. For some time, the author was in the service of the great minister, and it is possible that the book was, in part, directly inspired by him. As a mine of information it has been frequently cited; but there is little evidence that the book as a whole has ever been studied as a comprehensive expression of the economic aspects of France under Colbert. It is particularly interesting in its discussion of the economic rivalry of France with the Dutch and the English. Reynel's work is not so extensive in scope, and yet there is a marked parallelism as to ideas and point of view — emphasis on paternalistic control of trade, industry and national interests. It is noteworthy, however, that Savary has much less concern for the rivalry of English trade than Reynel has for that of France. For the Frenchman, as in the case of Colbert, the Dutch are the real competitors.

During 1674 "the universal clamour of the people of England on account of the increasing power of France, so dangerous to us and to all Europe, obliged King Charles . . . to come into terms of peace . . . with the states of Holland . . ." and the following year, "The English House of Commons being much out of humor with the conduct of their king and his ministers, acting so much in favour of France, and so diametrically opposed to England's true interests, and observing the immense consumption of French wares of all kinds, in England, and on the other hand, how little of English merchan-

dise was taken off by France . . . that House entered into an examination of the general balance of trade between England and France, and found that for some time past, England was annually losing above £1,000,000."[1] At this point begins the story which Ashley has told — the political alignment on the question of the balance-of-trade theory, and the evolution, from Tory opposition to the Whig arguments of "balance," of the ideas of free trade. It is important to observe, however, that from this time the struggle of Charles II to keep his alliance with Louis XIV was opposed more and more effectively by the Whig strength in the House of Commons. The king managed, in 1677, to stave off the chief act of hostility — prohibition of trade with France — by a commercial treaty.[2] But this treaty hardly mentioned commerce and in 1678 the Commons finally accomplished the long-desired prohibition.[3] The act of prohibition was passed for numerous reasons. There were religious, political, and genuine economic considerations as well as partisan motives which governed the purpose of the Commons. The act was in force until 1685, being then repealed[4] and replaced by a heavy tariff.[5]

In retrospect, it may be concluded that the events of these years from 1660 to the prohibition of 1678 present a constantly growing opposition to French economic enterprise. Much thought and some legislation was devoted to the circumstances of this apparent evil. Various theories and numerous proposals were advanced as solutions. The simplest remedy appeared, as ever, to be the elimination of competition. The most conspicuous advantage of this particular remedy lay in the

1. Macpherson, vol. ii, p. 571–574.
2. Hall, pp. 27 ff.
3. 29 and 30 Car. II, c. 1.
4. 1 Jac. II, c. 6.
5. 1 Jac. II, c. 5.

fact that, to economic hostility, was added all the force of national enmity sprung from religious differences and political antipathy. Attachment to any definite economic doctrine, as of the Whigs to the balance-of-trade theory, was more a matter of nationalist sentiment than of partisanship. The Whigs were the nationalists of this epoch in English history, standing for a defense of national principles and "British interests," — identical in so many respects with Whig trading concerns, — as against an un-national monarch in alliance with the chief national competitor. Tory opposition, on economic lines, to this Whig position could develop only after the national interests had been secured by the defeat of the foreign enemy. Thereafter, such developments could be little more than the doctrinaire adherence which political parties ever since have given in greater or less degree to economic principles.

LAURENCE BRADFORD PACKARD.

A NEGLECTED CHAPTER IN THE HISTORY OF COMBINATIONS: THE AMERICAN WOOL MANUFACTURE

SUMMARY

The wool manufacture seemingly not a promising field for combination. — The commencement of the American Woolen Company, 438. — The experience of the Company: growth in size, 442. — Selling policies, 446. — Labor policy, 452. — Financial experience, 455. — The Cleveland Worsted Mills Company, 464. — The United States Worsted Company, 467. — Significance of combination in the wool manufacture, 472. — Bases of success, 474.

DISCUSSION of combination and the trust movement in the United States has been curiously silent upon conditions in the American wool-manufacturing industry. Attention has been given to combinations in the allied cotton industry, as by Professor Dewing, who has traced for us the unfortunate careers of the cotton-yarn and cotton-duck organizations;[1] but seemingly the question has never been raised, why such misadventures occurred in cotton manufacturing, while steady progress was possible for the outstanding combination in the wool-manufacturing industry, the American Woolen Company.

On *a priori* grounds, the probabilities of successful combination would seem to be less favorable for the wool manufacture than for the cotton. To a considerable degree wool manufacturing is, and always has been, carried on in a large number of relatively small establishments, and these have been much less localized than many other branches of industry and most other

1. Dewing, Corporate Promotions and Reorganizations, chaps. xii–xiv. For an earlier discussion, see Copeland, Cotton Manufacturing Industry, chap. ix.

branches of the textile manufacture. Again, many concerns in the industry are primarily family affairs. Not only do these families hold tenaciously to their properties, but considerable good-will attaches to the output from them, by reason of the standards which these families have maintained. Finally, the industry is one in which the "law of balanced return," to employ Professor Dewing's phrase, would seem to make production upon a large scale uneconomical. The wool manufacture, I believe, labors under a disadvantage in this respect as compared with most portions of the cotton, and with many branches of the silk manufacture.[2] Peculiarities in the nature of the wool fibre necessitate a larger element of labor per unit of production than in many other lines of textile operation. Moreover, as with all textiles, the higher the quality of the woolen fabric, the more considerable is the element of direct labor in the factors of production; and the trend in American wool manufacture, in part the result of tariff conditions and in part that of our rising standards of living, has in recent decades been pretty steadily in the direction of higher grades of fabrics. Both for this reason and because of the predominant place of fabrics for human outer-wear in wool-textile production, the factor of style is of particular importance;[3] but, as is well known, style and large-scale production are not natural companions.

There are, however, one or two rifts in this cloud. The worsted branch of the wool manufacture is standardized and subject to large-scale operation in a greater degree than the woolen branch. The somewhat narrower variety of raw materials in the worsted industry,

2. The carpet section of the wool manufacture seems an exception to the general rule. Here for the most part labor plays a less important rôle.

3. Cherington (The Wool Industry, p. 119), in speaking of "most woolen and worsted piece goods," stated that for them "the element of style is conspicuous."

the nature of the manufacturing process, and similar features are causes of this difference.[4] Again, within both the woolen and worsted branches there are some fabrics much more standardized than others. Blankets, flannels, and oxford-gray mixtures among the woolen cloths, and serges, clays, and gabardines in the worsted group, are typical of the more standardized goods. Commentators on the American wool manufacture, recognizing (consciously or unconsciously) the superior suitability of such fabrics for American production, sometimes speak of their production as the "bread and butter" of the American wool-manufacturing industry. These features in the situation, moreover, have a special significance, as will shortly appear, in relation to the feasibility of combination within the trade.

I

The first and chief combination in the wool-manufacturing industry was, like combinations in many other lines, a by-product of the depression in the middle nineties. The depression was made peculiarly severe in the wool manufacture in consequence of the change in the tariff, which permitted the importation of wool duty-free for the first time in over thirty years, and took away the "incidental" protection that manufacturers had been receiving from the so-called compensatory duties. Probably of yet greater moment was the situation created by the rise of the worsted manufacture. The market was already well supplied by the products of the preëstablished woolen industry, and readjustment was inevitably difficult. Something of the struggle and its incidental damage is evident in the Census figures

4. This feature is illustrated in a comment made by one of the textile trade papers when in 1899 rumors of a combination were afloat: "We do not believe in the practicability of a woolen mill trust. . . . A trust among worsted spinners, however, might be worth considering." American Wool and Cotton Reporter, February 16, 1899, p. 14.

showing value of products in the two branches of the industry: between 1880 and 1899 the value of products in the worsted manufacture had increased from 33 to 120 million dollars, but meanwhile that in the woolen manufacture had declined from 160 to 118 millions. Such a shift was impossible without much friction and loss, which undoubtedly went far to intensify the force of the depression in the nineties. Some concerns, such as the Arlington Mills and the Pacific Mills, seem to have borne up satisfactorily under the conditions. At least, they kept up their dividend payments. More typical, I believe, was the experience of such concerns as the Hamilton Woolen and Middlesex Woolen companies. In these cases dividends averaging 6 and 9 per cent respectively in the years of 1890–93 fell to 1¼ and 4 in the succeeding four-year period. Indeed, these latter years have been characterized as "the period of least growth, relatively, in the history of the American wool manufacture for half a century"; and again, as, "without any reservation or qualification whatsoever . . . the most disastrous period in the history of the American wool manufacture." [5] Such a situation, when the return of prosperity made the financial arrangements less difficult, served to induce an attempt at combination within the industry.

In February, 1899, rumors of a possible combination in the wool manufacture began to circulate; and in March of that year it was definitely announced that an organization had been effected. The leading spirit was Mr. William M. Wood, at that time treasurer of the Washington Mills of Lawrence, a concern which was just getting back on its feet after a decade of severe

5. Bulletin of the National Association of Wool Manufacturers, 1896, p. 93; Mr. S. N. D. North before Committee on Ways and Means, Tariff Hearings, 1896, p. 1636. Of course, some discount may be allowed on these statements, since for political reasons the manufacturers were not inclined at that time to understate their difficulties.

trial. Curiously enough, Mr. Wood had received his earlier experience in the cotton-manufacturing business. Associated with him in the task of floating the new enterprise were Mr. James Phillips, Jr., and Mr. Charles Fletcher, each the owner of a small group of mills. These mills, seven in number, formed the nucleus of the whole combination. Subsequently nineteen other establishments were acquired and assimilated. Among these twenty-six mills were included some of the important plants of the country: besides the above-mentioned Washington Mills, the Fulton, and the National and Providence Mills, all known for their serges and men's wear worsteds, and the Assabet Mills, located at Maynard, Massachusetts, one of the largest woolen mills of the American industry. Most of the mills were located in the Providence or Lawrence-Lowell areas; but isolated concerns, from Moosup, Connecticut, to Skowhegan, Maine, were taken in.

The financial side of the organization was noteworthy in at least one respect: that it was carried through without the issue of bonds.[6] The Company, incorporated in New Jersey, was authorized to issue $25,000,000 of preferred and $40,000,000 of common stock. Of these amounts, $20,000,000 of preferred stock and $29,500,000 of common stock were issued at once. The greater portion of the common stock was used in the purchase of the mills, owners taking 50 per cent in cash and 50 per cent in the common stock of the new company; but $16,000,000 of the preferred and $8,000,000 of the common stock were sold to provide cash for the purchase of the mills and to secure working capital for the concern. That this flotation should not have taken place without the injection of a considerable amount of "water," was perhaps inevitable under the circumstances of the time.

6. $405,000 of the bonds of acquired concerns were outstanding, but these were cleared away in the next year or two.

Some light is shed upon this matter by a comparison of capitalization per loom between the American Woolen Company and representative wool-manufacturing concerns of smaller size. For the "big company," upon its formation, the average capitalization per loom was approximately $9,150. Corresponding figures for other corporations of that period were: Middlesex Woolen Company, $3,333; Pontoosuc Manufacturing Company, $2,666; Arlington Mills, $1,522; down to $426 for the Atlantic Mills.[7] The Census of 1899 gave the average capitalization for all mills producing woolen and worsted goods as $4,204 per loom. Accordingly, though the Company itself subsequently placed the value of its original plants at $40,000,000,[8] a more reasonable estimate would probably have halved that figure; and $12,000,000 would seemingly be sufficient for working capital.[9] Yet the situation compares favorably with that of other combinations of the period; and the existence of this surplus valuation may well have acted as a spur to more conservative financial management in the later years.

In comparison with the total wool-working machinery of the country, the manufacturing capacity of the American Woolen Company, as at first organized, altho of extraordinary magnitude in relation to either American or foreign experience, did not presage control of the domestic market for wool fabrics. It was not a monopoly of wool manufacture in any sense of the word. The Company's mills, for example, contained 541 sets of

7. To be sure, considerable allowance must be made for undercapitalization in the case of some, or perhaps all, of these mills, altho the above represents a random selection of wool-working concerns. In many such companies, especially family affairs, the item of capital has no great significance.

8. Annual Report for 1915, p. 2.

9. Contemporary estimates of value tend to support the lower figures. Moody gave a valuation of $25,000,000 (Manual of Industrial and Miscellaneous Securities, 1900, p. 500); and the value of the seven more important plants first brought together was placed at $12,000,000 (Commercial and Financial Chronicle, vol. lxviii, p. 472).

woolen and worsted cards, as compared with 6,605 sets reported for the whole country in the Census of 1899. In spindles and looms there was about the same relationship: approximately 300,000 spindles of all types against a total of 3,500,000, and 5,400 looms against 63,300.[1] The scope of its mills, however, was not all-pervasive, either in the woolen or the worsted branch of the industry, the weakness in women's dress goods being particularly important. The concentration of its activities in fewer fields of course made for greater strength of the Company in those particular lines. Its power was especially great in the field of men's-wear goods. The proportion of its equipment to the total of such machinery in the country was estimated to be "very large," being placed more specifically at "about 70 per cent" for such worsted goods, and "about 50 per cent" for such woolens.[2] In this production was a substantial yardage of serges, cassimeres, and the like, as, for example, the Washington and Fulton serges, — in other words, the fabrics spoken of above as susceptible in a greater measure than other wool goods of standardization and large-scale production. With respect to these lines, the position of the Company must be admitted to have been one bordering on quasi-monopoly, and suggested the possibility of considerable influence by the Company in the control of the market for such fabrics.

II

The experience of the American Woolen Company since its formation has been noteworthy in various respects: growth in size, improvement in methods of

1. Statistics for the Company's equipment are taken from Mr. Wood's testimony before the Industrial Commission, Report, vol. xiv, p. 513.

2. Bulletin of the National Association of Wool Manufacturers, 1899, p. 208; Commercial and Financial Chronicle, vol. lxxi, p. 1316 (official statement to the New York Stock Exchange).

operation, influence on the cloth market, labor policy, and its financial progress. It is proposed to discuss these features *seriatim*, dealing, however, with only the more general elements in each.

Growth in size. From a union of 26 mills the Company has grown to number 59 establishments, and there has been a corresponding increase in manufacturing capacity. The number of worsted combs has increased approximately 150 per cent, cards 100 per cent, spindles of all types 150 per cent (the advance probably being greatest in worsted spindles), and looms about 85 per cent.[3] This enlargement has in large measure been due to the absorption of concerns previously independent, some 25 having been purchased since 1899. Almost all these mills are located in New England, with especially large representation in Maine.[4] Again, machinery has been added and extensions made to existing plants. One of the outstanding developments of the Company, however, has been the construction of new plants, especially the Wood and Ayer mills of Lawrence, Massachusetts. The former, completed in 1907 and incorporated into the Company in 1910, is said to be the largest individual worsted mill in the world. As a result of all these measures, the increase in capacity of the Company has been substantially more rapid than that of the whole American industry. Thus, as against the 150 per cent increase in worsted combing machines above-mentioned, the growth for the whole country since 1899 has been only about 60 per cent. In spindles, the respective increases have been: for the Company, 150 per cent, and for the

3. Statistics as to the present equipment of the Company's establishments have been taken from its pamphlet entitled "American Woolen Company's Mills," published in 1921.

4. The acquisitions have not been confined to any particular period of the Company's history. As early as 1901, two mills in Lawrence were bought at an auction sale; and as late as 1921, a group of three mills around Norwich, Connecticut, was absorbed. Most of the important woolen mills in Maine are now owned by the Company.

country, 85 per cent. In looms, 85 and 25 per cent respectively. Obviously, then, the position of the Company is one of even greater moment to the public interest than at the inception of the concern. However, as far as one can ascertain, there has been no significant change with respect to those lines of production, especially men's-wear worsteds, in which it held a predominance already in 1899. Rather, the increase in capacity has gone to build up the Company's production in fields previously neglected, women's dress goods, blankets, and the like; with some enhancement also in the line of men's-wear woolens. In so far, then, the extremely rapid growth of the Company has not meant an increase in menace to the competitive producer or to the consumer.

The progress of the Company, it may be noted further, has not been merely in quantity of machinery. One of the first steps taken by the management after the launching of the combination was to transfer machinery from certain mills to others. One mill was closed entirely, as "it was antiquated and located in an undesirable place for woolen manufacturing"; and the production of some of the mills was changed. Such rearrangements flowed in part from a desire for greater efficiency and in part from the policy of specialization among the several plants; [5] tho to what extent this latter policy has been carried is not indicated in any of the Company's subsequent reports.

As a result of these various extensions and improvements, together with other factors such as the introduction of improved machinery, the volume of production by the Company was stated to have doubled as early as

5. Mr. Wood before the Industrial Commission; Report, vol. xiv, pp. 514, 518; and Bulletin of the National Association of Wool Manufacturers, 1899, p. 272. The concentration of a large proportion of the Company's blanket production at the Assabet Mills at Maynard is a case in point.

1903.[6] Data as to the Company's sales do not indicate quite so rapid a rise, but do suggest such a situation, as far as value is concerned, by 1906 or 1907. Meanwhile, the production of woolen and worsted fabrics by the whole American industry had in value increased by about 75 per cent.[7] Again, it was "calculated" in 1899 that the original equipment of the Company's plants was "capable of producing some 30 million yards of cloth annually." [8] whereas, according to a pamphlet of the concern published in 1919, its total capacity of all classes of fabrics was then 70 million yards per annum.[9] It is somewhat uncertain how accurate these figures are; but at least the increase on the basis of quantity has been substantially less than on the basis of value. With these data, however, should be compared the enhancement in quantity of all American mills — only 25 per cent between 1899 and 1919.[1] Obviously, the growth of

6. Annual Report of the Company for 1903, p. 2.

7. The statistics of sales, in so far as available, — their announcement was discontinued after 1903, — are as follows:

1899	$20,598,049 (Mar. to Dec.)	1905	$48,660,449
1900	29,673,207	1906	51,420,696
1901	34,839,690	1907	47,377,846
1902	35,522,977	1908	29,986,978
1903	38,097,558	1909	48,000,000 (approx.)
1904	39,446,832		

Of course, there was an enhancement of prices during this period, but a lowering of average quality would counterbalance in whole or in part this change. With such a heterogenous production as that of the American Woolen Company, it is a difficult matter to estimate quantity from the basis of value. The Census of 1909 gave a value to the products of the woolen-goods and worsted-goods industries of $423 million as compared with $238 million in 1899.

8. Bulletin of the National Association of Wool Manufacturers, 1899, p. 272.

9. Pamphlet entitled "From Wool to Cloth," p. 34. However, in 1919 the actual output was only 49 million yards. Wall Street Journal, May 27, 1920, p. 102. Seventy million yards is here stated as the Company's "normal output."

A recent popular statement of the Company's huge production asserts that "enough woolens and worsteds are woven per year by the American Woolen Company to provide suits of clothes for more than twenty million people." Outlook, January 10, 1923, advertisement of the Company.

1. The Census of 1899 gives a total production of 427 million square yards for the woolen and worsted goods industries; and that of 1919, one of 535.9 million square yards.

the Company's capacity, significant on an absolute basis, is even more suggestive when the conditions in the whole industry are considered.

Selling Methods and Policies. In the distribution of its products, the Company has displayed ingenuity and good judgment mixed with courage, while its influence has upon the whole been for the improvement of the trade. Its most notable contribution perhaps has been the endowment of greater significance to "openings" in the selling mechanism. Semi-annually, usually in February and August, the Company definitely "opens" its lines for the succeeding season, sometimes for all its departments at once and sometimes one or two departments at a time,[2] displaying its designs for the coming winter or summer period, and stating its prices for the numerous fabrics. These openings attract interest throughout the trade and, if a good selling season is anticipated, the Company's showrooms will be crowded from morning till night. Upon the basis of orders then placed the manufacturing end immediately commences operations.[3]

To stimulate purchases at the time of the openings, and to give greater stability to the trade, the Company introduced about 1909 — one of the by-products of the preceding crisis — a guaranty of prices, at least in so far as reduction is concerned. Likewise the Company later coöperated in the establishment and maintenance of an

2. To handle efficiently the large and diversified production of its mills, the American Woolen Company at the beginning of its career organized its New York direct selling house into a number of semi-independent departments, each with its own selling staff. The original alignment provided for four such divisions: worsted and woolen staples, fancy worsteds, fancy woolens, and cloakings and suitings. Subsequently there has been a minor rearrangement of these classes, putting all the woolens together; and with the expansion in scope of the Company's operations the addition of three more departments, for women's wear, blankets, and specialties, such as uniform cloth, shoe cloth, etc.

3. In reality some of the preparatory sections of the mills often commence operations somewhat before the openings terminate — sections on worsted spinning and the like.

"open-price association," which until its recent discontinuance also tended to give stability to the selling end of the industry. Such policies, together with the influence of the Company against cancellations, are in a way the fulfillment of a prophecy made at the time the Company was organized, that it would have "a larger interest than any other corporation in the restoration of legitimate methods in the woolen trade, and a larger power to effect it." [4]

Even beyond these features of trade practice, however, the influence of the Company upon the tone and price level of the market for wool fabrics has unquestionably been great. Apparently more and more the trade has come to depend upon the "big company" for the direction of the industry in the following season, for setting the pace. Typical expressions of the part played by this concern are: "Business in new heavy-weight woolen and worsted suitings has been slow and buyers are apparently waiting for the opening of the American Woolen Company's lines"; [5] or "selling agents are generally reserving their showings [in men's wear] until the American Woolen Company makes prices." [6] More particularly, among the quotations on the Company's fabrics the prices of certain standardized fabrics are watched at the openings, and above others the so-called Fulton serge 3192. It is a cloth of well-known and fixed construction, which has been manufactured for years, and for which there is always a considerable sale. Consequently, as Professor Cherington has said, "it has come to be regarded as a standard of reference in the trade. Its price, as announced by the American Woolen Company when it opens its season's lines, is widely ac-

4. Mr. S. N. D. North, Secretary of the National Association of Wool Manufacturers, in their Bulletin, 1899, p. 210.

5. Commercial and Financial Chronicle, vol. 72, p. 200 (Jan. 26, 1901).

6. Textile World Journal, vol. 57, p. 405 (Jan., 1920).

cepted as virtually this Company's estimate of what the sum of the cost of wool, manufacturing cost, and a minimum mill profit is to be for the season." And "this Company's estimate carries great weight with the trade." [7]

But the opening prices of the Company's sales are not always a mere statistical analysis of existing industrial conditions. The Company has used its influence, tho perhaps unintentionally, to give the right cue to the trade when the future seemed uncertain to many dealers. For example, after the crisis of 1907, the "big fellow" determined upon a new start, writing off the loss in values. At that time, "considerable satisfaction was expressed in dry-goods circles at the action of the American Woolen Company in squarely meeting the changed conditions and opening their new lightweight men's-wear woolen and worsted lines at more severe reductions compared with last year than many had in any way looked for." [8] Again, when the trade was in the doldrums after the armistice in 1918, wondering what was coming next and afraid to go much beyond hand-to-mouth business, the American Woolen Company opened up with sharp reductions in its prices.[9] This event had an electrifying influence at once, starting the renewal of activity in the industry, which lasted until the crisis of 1920. In 1921, too, the Company again swallowed its losses, as the phrase goes, and by directing prices to a lower level, was instrumental in a considerable measure in breaking the "consumers' strike."

In the way of direct influence upon the general course of prices for wool fabrics, the American Woolen Com-

7. Cherington, The Wool Industry, p. 101.

8. Commercial and Financial Chronicle, vol. 87, p. 177 (July 18, 1908).

9. Cf. statement of Textile World Journal, March 1, 1919: "The influence on the market so far of the American Woolen Company's aggressive policy is unmistakable." Vol. 55, p. 1475.

pany seems ineffective. Despite its extensive production of certain lines of fabrics, suggestive of a quasi-monopoly in these portions of the industry, the movement of its prices for such goods is not indicative of any monopoly gains when compared with the movement of prices for other wool products. The reason for this situation seems to me to lie in the fear of actual and potential competition, combined with the play of the style element. In the standardized and semi-standardized men's-wear fabrics, there is competition from the small differentiated mill, which is often able to pick up lots of yarn advantageously in the market, and from the other large-scale producers of such goods in the American industry, as, for example, the Cleveland Worsted Company, one of the smaller combinations in the trade. Then, too, if a price materially out of line is insisted upon by the American Woolen Company for these fabrics, many producers of finer goods will be induced to divert their attention to this field. On the other hand, for goods other than the standardized types, the element of style is particularly important, and no concern has a monopoly of fabric design. It is sometimes said of the finer woolen fabrics, where generally speaking this element is dominant, that a mill of a hundred looms is the maximum size for effective designing. Beyond that point the mill, like the preacher of an equivalent number of sermons, is likely to fall into repetition. Moreover, the small mill is able to shift its production quickly in consequence of a style change, when, as at present, the efforts of the wide-awake manufacturers are rendered more effective by the aid of well-organized means of disseminating trade information. Again, competition in this portion of the field is active or potential from abroad as well as from the other domestic mills, being more important here than in relation to the standardized

fabrics. Such competition is the more threatening because in the conversion of fabrics into wearing apparel considerable difference in the price of the cloth effects a relatively small variation in the price of the garment.

The Company has, I believe, fixed upon the wiser policy of quoting good, average, tho competitive prices, relying upon the assured quality of its products, upon its capacity for the largest order, upon the maintenance of a large stock of its staple goods, and upon efficiency of operation, to secure a maximum of turnover with a sufficient spread between its costs and the going market price to afford a substantial profit.[1] It appears probable, as regards the last factor, that few if any mills in the United States can turn out goods as efficiently as those of the American Woolen Company, both by reason of the considerable specialization of product among the various establishments, above mentioned, and the economies of large-scale operation. In addition, the Company is said to maintain a research department on technical matters, almost unique among American mills — I know of but one other. Altho it is uncertain how much emphasis is placed upon this phase of the business, — and of course the results are not broadcasted, — the fact is significant both of the Company's effort for differential advantage and of its progressiveness.

It must not be inferred from the above description of the concern's selling policies that it is either a public benefactor or an infallible judge of conditions in the goods markets. It is producing fabrics for a profit, and naturally attempts to secure the maximum possible prices for its goods. The Government was unsuccessful

1. An incident illustrating the advantages of the maintenance of stocks of goods is said to have occurred in 1917, at the outbreak of the war. The quartermaster-general of the Massachusetts militia was feverishly trying to find blankets for the newly mobilized men. He inquired of several smaller mills and could secure only promises of supplies in a month, three weeks, etc. Then he called the American Woolen Company, stating the number he wanted. The reply came back: "They 'll be in Boston tomorrow."

in proving any real "profiteering" when that campaign of inquiry was on in 1920; but the configuration of the price curves for various Company fabrics over the period since its organization suggests that at times it has tried to "crowd" the market. Aiming at the fullest possible market price, the Company has seemingly overstepped the boundary of discretion, as when after a sharp increase in prices in 1910 there followed a somewhat similarly sharp drop the succeeding year. Indeed, these price curves are rather remarkable for the number of changes in direction.

A more outstanding case of misjudgment is concerned with the efforts of the Company to establish a foreign trade in its products. Apparently it was carried away, with many other companies, by the export furore of the war and early post-war periods. In the saner days of 1914, the President reported that, "after a determined effort to sell our fabrics in the open markets of the world, we have been forced to the conclusion that as a general proposition we are unable to compete with the low-wage labor of Europe." [2] Yet the next year his opinion was veering around. Now this export trade was to be "sedulously followed." [3] By 1917 a subsidiary concern, the American Woolen Products Company, had been incorporated to take care of this new business, and connections had been established for selling purposes in various foreign countries. In 1919 such branch offices and representatives existed in fourteen foreign countries besides "Central and South America," including such important wool-manufacturing nations as England, France, and Belgium.[4] Here was an "American inva-

2. Annual Report for 1914, p. 2. 3. Annual Report for 1915, p. 3.

4. Annual Report for 1919, p. 3. The Products Company had meanwhile undertaken a somewhat diversified trading business. Cotton textiles, knit-goods, silk goods, hosiery, leather, and leather findings were exported; wool, and wool and cotton yarns were purchased and resold abroad; while manufactured goods and raw materials were imported.

sion" with a vengeance! In another year, however, the business was "very quiet"; and at the end of 1921 the Products Company was liquidated. The Emergency Tariff was in part blamed for this sudden demise, but again, as in 1914, the "low cost of production" in European countries impinged upon the President's consciousness.[5] It may well be that the profits on this foreign business during the brief period of its heyday more than compensated for the effort involved,[6] but it should be observed that, in so far as plant facilities were extended in the prospect of such business, the ultimate cost may go far to wiping out the immediate profits. But immediate gain seems to have been at least not the major feature in the program. The establishment of a separate corporation for the handling of this export trade, and of a series of foreign "branches," points to an anticipation on the part of the Company's directors that such a trade would thereafter be a normal portion of its operations, tho the idea of a permanent outward trade in American woolen fabrics is to most conservative observers distinctly chimerical within the visible future.

Labor Policy.[7] In its treatment of labor, as in its selling methods, the American Woolen Company may fairly be said to be a leader in the industry. It is in large measure responsible for whatever unfortunate policies the wool manufacture has adopted, and for whatever disagreeable situations that manufacture has found itself in, as well as for the beneficial attitudes that the indus-

This last measure was undertaken because of the difficulty which foreigners had now encountered in financing purchases in American markets.

5. Annual Report for 1921, p. 3.

6. Shipments of $1,300,000 in goods were reported for 1917 (Annual Report of that year, p. 3), while by 1919 the delivery of $4,500,000 worth of goods, apparently of all sorts, and unfilled orders of $4,800,000 are mentioned (ibid., for 1919, p. 3).

7. It seems inadvisable in such a paper as this to examine closely the various labor difficulties of the wool manufacture in the past, and the part which the American Woolen Company has played in them, such as the strike in its mills in 1902, or the Lawrence strike of 1912. Only the more general features of the labor aspect will be considered.

try has assumed; and in many ways it has been far-sighted as compared with most of its competitors. Early in its career, seemingly, it adopted the policy of paying the highest wages obtaining in the trade. Sometimes, as in its bonus or premium system prior to 1912, it rendered itself unpopular among the workers by insisting on a *quid pro quo* for such higher wages. But all along it has probably been true that a worker could earn in the Company's mills as much as in the outside establishments, or more. The aim obviously was to combat one of the great evils on the labor side of the wool manufacture — high labor turnover. This line of policy, it should further be emphasized, has been pursued in a considerable degree independently of the rest of the industry. This was evident in the period of rising wages prior to 1920, when the "big fellow" frequently led the advance within the wool manufacture; and again in 1922, when at a time of agitation for lower wage rates it was stated by "him" that wages for the current season would under no circumstances be reduced.[8]

The Company, too, has been as forward as most other concerns in the industry, and indeed ahead of the great majority, in adopting a welfare program. In its mills cleanly conditions are maintained, sanitary arrangements are good, and frequently special facilities, such as low-cost restaurants, are provided. In connection with some of the larger plants, workers' houses, model tenements, and recreation houses have been erected. The construction of a model village about the Shawsheen Mills is but a continuation of this development.[9]

8. A story is told about one of the later increases of wages, in the period before 1920, that Mr. Wood called various leading wool manufacturers together and told them he was going to do thus and so, — it was a 20 per cent increase, I believe, — and intimated that his competitors could do what they liked about it; for his part, he was going through with the advance.

9. The ultimate position of this new development in the sentiments of the employees seems as yet uncertain. From one source comes complaint that everything in Shaw-

At the height of the wave of prosperity which culminated in 1920, the Company embarked upon a whole series of noteworthy, if somewhat belated, schemes for benefiting its employees — or perhaps allaying the labor unrest. Not only was the home-building project largely expanded and the 48-hour week adopted, but, under the direction of a new Department of Labor in the organization, its employees were insured without cost to them under a group life insurance plan. They were presented with an elaborate system of sickness, accident, and maternity benefits, and were assured substantial pensions in their old age. Likewise, they were enabled to secure a stake in the concern by a liberal system of stock sale, with of course the usual requirement of "continuous service" in the Company's mills. Such schemes, especially that of gratuitous sickness, accident, and maternity benefits, are distinctly in advance of the industry as a whole.[1]

The result of such policies, as indeed of the whole attitude of the Company, must be the acquisition and retention of a somewhat better group of operatives than the competing mills can command; and probably the additional efficiency of these workers more than compensates for the higher earnings paid or expenses incurred. The pace set, moreover, is unquestionably disquieting to the independent manufacturers, and incidentally may well contribute to the willingness of some concerns to sell out to the growing "combination." Above all, this general policy indicates, I believe, an

sheen village goes by preordained rule: one shall wash only on Monday, one shall trade only at the village laundry, etc. On the other hand, one who was apparently a workman and resident of the place, in directing me to the village when I was still a little way off stated with much feeling: "You 're on the road to Heaven!"

1. Annual Report of the Company for 1919, p. 2; Commercial and Financial Chronicle, vol. 112, p. 2308. Not without effect, also, was the Company's well-advertised contest with the "profiteers" of Lawrence in 1919–20, when the Company set up retail stores of its own in certain lines.

energetic and far-sighted grasp of the situation by the "big company." [2]

Financial Experience. No detailed study of the financial policies and record of the American Woolen Company can be attempted here; but at least two features on the financial side should be noted: the general quality of its financial operations, and the amount of its pre-war earnings.

The character of its financial policy is in part revealed by a study of the Company's annual balance-sheets. For example, the item of plant was originally placed at approximately $40,000,000. This figure was probably a seriously inflated one in 1899; but at least it is significant that in 1920, despite the addition of a score of mills, including the mammoth Wood mill, this item has been increased by only $10,000,000. It is notable also that the increase in capitalization has not kept pace with that of manufacturing capacity, at least as measured by the quantity of machinery. Whereas in 1900 capitalization per loom had amounted to over $9,000, the latest figures available, even after the recent doubling of its common stock, show that the Company has a capitalization per loom of but $8,059. Meanwhile, the mills generally through the country have shown a marked enhancement of capital. The Census statistics, which had indicated an average capitalization per loom for the whole wool-cloth industry of only $4,200 in 1899, give the corresponding figure as to 1919 of nearly $11,000.

2. At one time, some fifteen years ago, the Company was said to be inducing immigrant labor to seek employment in its mills, by encouraging foreigners resident in Lawrence and other places to write to relatives in Europe, or other prospective immigrants, by advertising in foreign ports, and the like. The story seems to have been exaggerated. Apparently some such measures were taken by the Company, but only in connection with filling up the huge Wood mill, then just being completed. The addition of this large unit to the manufacturing capacity of Lawrence naturally exhausted the labor supply of that area. Rather than compete with other mills for the existing labor, the Company made some effort to tap the incoming flood of immigrants. Seemingly it was an ephemeral matter, not part of an accepted policy.

There may still be found mills with a much lower capitalization per loom than the American Woolen Company, e. g., the Standish Mills with only $6,250, or the Talbot Mills with but $2,500. Yet unquestionably the "big company" now stands much more closely in line with representative concerns of the wool-working industry than it did in 1900. Indeed, it seemingly enjoys a somewhat lower capitalization in relation to manufacturing capacity. Again, altho the mills of the Company, or at any rate the mills originally acquired, were purchased with equal portions of common stock in the new company and of cash, dividends upon such stock had not been paid prior to the war, even tho the books of the Company showed a considerable and relatively steady increase of surplus, amounting to 50 per cent on the outstanding junior stock by 1911. Instead, the Company devoted its funds to the reduction of this capitalization, writing off $9,500,000 in this same year 1911.

But perhaps most suggestive of all has been the Company's policy with regard to financing the erection of new mills. The acquisition after 1899 of already existing plants was carried through largely by the increase of its preferred stock, which grew from the original $20,000,000 to twice that amount in 1909; but not the construction of such mills as the Wood and the Ayer. For this purpose a new corporation was, in each case, created, having the same officers as the American Woolen Company; and funds for the actual building were secured by the sale of its notes or bonds. These securities were, to be sure, guaranteed by the Company, but the accounts of the new mill and its profits were kept separate until these obligations were paid off. Thus, not merely were the plants of the Company kept free from any direct mortgage, but the extension was

made to pay for itself and was not admitted into full partnership with the rest of the establishments until it too was free from debt. Confidence in the ability of such an offspring to take care of itself may well have added to the marketableness of the $5,500,000 worth of bonds — really but the mortgage on a small tract of land — floated in 1921, when the project of the Shawsheen Mills was matured, altho of course the guarantee of the parent company was the more important factor.

Turning to our second point, that of earnings, one finds a situation of which at least certain aspects are not so happy. The 7 per cent dividend on the Company's preferred stock has, it is true, been paid regularly since 1899, and this despite the doubling of its amount. On the other hand, no dividends at all were paid on the $29,000,000 (later $20,000,000) of common stock, and in four years of the period 1900–14 the dividends on the preferred shares were apparently not earned: the Company's statements of net earnings, after deduction of the depreciation charges there indicated, do not show such dividends to have been covered. Indeed, in five-year periods the net earnings on the preferred stock minus depreciation charges set up by the Company, and on the junior stock minus depreciation and preferred dividend charges, averaged as follows:

	On preferred stock	On common stock
1900–04	14.03	4.74
1905–09	8.19	1.57
1910–14	5.76	0.00

Any attempt to go farther than the statement of such relatively simple facts would bring us into the realm of conjecture. Neither the financial statements of the concern nor the annual reports tell a very complete story; and industrial enterprises in the position of the American Woolen Company are not disposed to go much be-

yond their published accounts in elucidation of their financial policies or status. With the unsatisfactory material available, conclusions must be uncertain.

It is possible, for example, that the percentages of earnings just presented should be subjected to considerable revision because of the variation and a possible inadequacy of the depreciation charges. During the first five years this factor was largely ignored, only $100,000 a year on the average being allowed. Then, when profits increased in the next period, $1,400,000 a year was written off; but in 1910–14, perhaps because of increased preferred dividend requirements — they had doubled since 1900–04 — only $300,000 per annum was entered on this score. Quite apart from academic criticism of such a pleasant-day treatment of depreciation, the important question arises: were the charges to depreciation entered on the Company's income statements all the charges of identical effect and purpose made by the Company; or have there been deductions from income concealed from the public eye which actually went into plant maintenance, even into plant extension and improvement. Much hangs on the answer. The fact that any such charges were made, seems to imply they were all those actually made. The sympathetic movement in profits and formal depreciation allowances might also seem to favor such a contention.

If in fact the formal charges for this item have been the only ones made, it obviously is incumbent on the investigator to set up more regular and adequate deductions. One may then urge that inasmuch as the depreciation charges since 1914 have averaged $2,800,000 a year, it would not be unreasonable to estimate proper annual charges for this factor in the several previous periods as at least $1,000,000 in 1900–04, $1,400,000 in 1905–09 (the rate actually used), and $1,800,000 for the

final period.[3] If such charges be allowed, the percentage of net earnings on the preferred stock for the several periods would become 9.53, 8.19, and 2.37 per cent, respectively; and on the common stock, 1.69, 1.57, and again nothing at all, respectively. With this possible revision of depreciation charges, it would appear that the preferred dividends were not on the average earned in the whole pre-war period, while on the common stock (as an inspection of the detailed figures would show) the profits registered in the first decade were more than counterbalanced by the losses in the last five-year period. It would also follow that the surplus, built up in 1912 to $12,000,000, was at least in part the result of inadequate provision for this item.

An alternate theory, however, is equally tenable, namely, that depreciation was in some degree, perhaps in a considerable degree, taken care of before any figures of profits were announced. Some support for this theory is to be found, moreover. For example in one of the Company's early reports it is stated: "Since its organization, the Company has expended in improvements, enlargements, etc., $5,597,940 from earnings, which is in addition to the expenditures for repairs charged to current expense."[4] Again, the policy of making considerable charges against earnings to cover depreciation without formal statement of such action is quite in line with that pursued by other New England textile concerns. Finally, there is substantial evidence of real prosperity in the Company. The mills, according to all accounts, are kept in first-class condition. The

3. To be sure, depreciation charges after the establishment of the income and excess-profits taxes were perhaps not permitted to fall below the possible maximum; but allowance has, I believe, been made for this factor. In estimating the increased charges to this item, I have endeavored to keep well within the figures of average depreciation for textile establishments (3 per cent on buildings and 6 per cent on machinery) suggested by Montgomery, Income Tax Procedure, 1921, p. 895.

4. Annual Report of the Company for 1903, p. 2.

Wood and Ayer mills were certainly paid for out of earnings; and the elimination of "water" from the enterprise, suggested by the decline in capitalization per loom as mentioned above — the decline would have been much more before the recent doubling of the common stock — was presumably accomplished by this turning-back of profits. It is, indeed, possible that the Company in reality possesses a considerable hidden reserve or surplus through carrying its plant at improperly low figures on its books. A concern which really was in this position could not be charged with making insufficient charges for depreciation.

This very difficulty which confronts the investigator, — the necessity of choosing between such opposite conclusions, — gives rise to at least one criticism of the Company's policy. It should not be rendered as difficult for the ordinary stockholder — who of course must share the same perplexities as the investigator — to secure a more exact appraisal of the concern's real position. Enigmatic accounting, even if it should err on the side of conservatism, cannot be most serviceable to the Company's own constituents.

In the matter of financial policy itself, there is also a possible criticism. Repeated reliance upon the issue of preferred stock for the acquisition (or to secure funds for the acquisition) of additional plants in the end gave rise to a disproportion between this class of security, carrying a contingent charge upon earnings, and the amount of junior stock. From 1911, when a considerable block of common stock was redeemed, until the doubling of this share capital in 1920, prior-lien stock comprised two thirds of the total capitalization. The maintenance of dividends on so large a quantity of preferred shares was apparently a considerable burden to the Company at one time during this interval. In the difficult years of

1912 and 1913 payments of dividends was possible only through a trenching upon surplus to the tune of $4,000,000. Perhaps the necessity of these dividend payments throughout the Company's history was responsible for the irregularity, and possibly the inadequacy, of the charges to depreciation just considered.

But the Company's financial record since 1899 remains to be appraised from yet another point of view. Has the formation of the "combination" led to greater earnings than were secured in the aggregate by the constituent companies before their consolidation? Has the earning capacity of the Company fulfilled the promoters' expectations? Does the Company's record compare favorably with those of outside individual concerns? Data for answering these questions, however, are unfortunately very meager. The dividend records of the companies incorporated into the "combination" are not available, and are probably impossible of ascertainment. Moreover, inasmuch as most small mills in this industry are well known to be, as a rule, much undercapitalized, the records themselves would convey little. Actual net earnings of such concerns would probably be even more difficult to secure. The only statement I have discovered relates to the eight mills which formed the nucleus of the 1899 organization. For these properties, including the most important mills, — the Washington, National and Providence, and Fulton plants, — the average net earnings of the two years 1897 and 1898 were given as $2,593,000.[5] Compared with this, the net earnings as reported by the Company itself, arising from mills which increased in number from twenty-six to fifty, averaged by five-year periods, after deducting only the Company's own charges for depreciation: $2,806,000 for 1900–04; $2,622,000 for 1905–09; and

5. Commercial and Financial Chronicle, vol. 68, p. 472.

$2,302,000 for 1910–14. On the face of the returns, the combination has not been a source of any extraordinary profits. Yet here again one runs upon that baffling feature: have profits been concealed by their reinvestment in plant? [6]

Possibly, however, some further suggestion may be gained by comparison with other companies. Here too information unfortunately is scarce. The Cleveland Worsted Mills, another combination, paid 7 and 8 per cent dividends throughout the years 1902–14; and the United States Worsted Company, still another minor combination, seems to have paid 7 per cent on its preferred stock from 1908 to 1912. The Arlington Mills averaged above 7 per cent dividends during the whole fifteen years 1899–1914, and the Farr Alpaca Company averaged 24 per cent (on an inordinately low capitalization) in the five years 1909–14. Such records compare favorably with that of the American Woolen Company. Moreover, in the case of some of these concerns, such as the Arlington Mills and the Cleveland Worsted Company, the plants have probably been maintained in as excellent shape as that of the "big company," and they have been as free of financial embarrassment. For example, the Cleveland concern has been able to make additions to its capacity by the cash purchase of other mills. Yet the data do not suggest really greater success in the case of these smaller concerns. In a word, the evidence is inconclusive.

Nevertheless, unless the former of the alternatives above mentioned be proven true, i. e., unless it be shown that inadequate allowance for depreciation has been made by the Company, it would appear improper,

6. If it be true that depreciation charges in these years were in fact inadequate, and the charges mentioned above be substituted, the net earnings of the Company would be reduced to: $1,906,000 in 1900–04; $2,622,000 in 1905–09; and to $1,811,000 in 1910–14. (The second figure is not affected as I have employed the same depreciation charge in each case.)

even on the basis of pre-war earnings alone, to add the American Woolen Company to the list of combinations which have been financially unproductive; or rather, to the list of those which have yielded smaller returns after their organization than the constituent companies had shown previously.[7] I am inclined, even on the unsatisfactory data available, to credit the concern with substantial financial success. It has probably had in reality a more prosperous career than the statistics presented for public consumption would warrant one to assume. Seemingly its attainments would give it a position in advance of other major combinations in the textile industry, and assure it no unflattering place even in comparison with all combinations of American industry.

Finally, one may chronicle the Company's unquestionable prosperity during the war and early post-war periods. As with most concerns in the wool manufacture, the war came as a distinct boon, — in this particular case, after years when payment of dividends had eaten substantially into surplus. The Company now charged to depreciation sums undoubtedly sufficient, making up, if it were necessary, charges to this purpose postponed in earlier years. Moreover, it was able to pay substantial dividends on its common stock, to set up reserves for its insurance and pension schemes above noted, and to build the surplus from $8,000,000 to $31,000,000. Finally, by writing off in 1919, $7,250,000 for "possible decline in inventories," and by the sale in 1920 of $20,000,000 additional common stock,[8]

7. Cf. Jones, The Trust Problem in the United States, pp. 538, 539; Dewing, "A Statistical Test of the Success of Consolidation," Quarterly Journal of Economics, November, 1921, pp. 84–101.

8. The flotation of this stock by the underwriting syndicate came just as the crisis of 1920 was breaking, and as a result failed miserably. Not until the middle of 1922 did the market price of this security recover to a point equal to that when the flotation was essayed.

it entered the period of subsequent depression in an unusually advantageous condition.[9]

III

The combinations in the wool manufacture other than the American Woolen Company are relatively minor in scope; and there have been but two, the Cleveland Worsted Mills Company and the United States Worsted Company. It may be objected, moreover, that the former is not a "combination" at all; and admittedly it represents a case of expanding large-scale management, not the union of previously independent concerns at one time and on essentially uniform terms in a single venture. It is included here primarily because from the point of view of operation the two industrial forms have much in common.[1] While these smaller groups cannot compare in size with the "big company," their experiences are noteworthy, if only to bring out the points of strength, industrial and financial, of the latter's position.

Cleveland Worsted Mills Company. Following the successful flotation of the American Woolen Company came a series of attempts at further combination in the industry. It is stated that "at one time during the year [1899] there were pending carefully devised plans for combination in nearly every branch of the wool manu-

9. The earnings of the Company during the war and post-war periods are not closely germane to the above discussion, but may be stated for purposes of reference. On the common stock, i. e., after caring for depreciation, reserves, and preferred stock dividends, the earnings amounted to: 1915, 6.40 per cent; 1916, 15.32 per cent; 1917, 65.61 per cent; 1918, 86.36 per cent; 1919, 39.89 per cent; and 1920, nothing. Dividends on this stock were paid as follows: 1916, 3½ per cent; 1917 and 1918, 5 per cent; and 1920 and 1921, 7 per cent. (In arriving at the above earning ratios, reserves set aside in one year and later restored to surplus are themselves restored to the earnings of the year when first set aside.)

1. If the Cleveland Worsted Mills Company be denominated a "combination," so must a whole group of smaller agglomerations, from M. S. Stevens & Sons Company, with its six separate mills, to the American Textile Woolen Company, with its two or three little plants scattered in Kentucky, Tennessee, and Georgia. Except in size, they differ in no essential feature from the Cleveland concern. They present an interesting phenomenon of the present wool manufacture, but they are not "combinations."

facture — yarns, worsteds, woolens, carpets, etc. A variety of reasons prevented successful culminations: chiefly, that the arrangements were made so late that it became impossible to finance them successfully on account of the great number of similar combinations which had been earlier effected in other lines of industry, and had overcrowded the market with this class of securities."[2] Indeed, the time had passed for such ambitious schemes. When the next large project, the Cleveland Worsted Mills Company, was launched, the procedure was more cautious and, as already intimated, of quite a different character. A manufacturing concern of some years' standing, the Turner Worsted Company, was in 1902 reincorporated as the Cleveland Worsted Mills Company, and this new enterprise at once acquired, by cash purchase, four other plants, two in Ravenna, Ohio, and two in Philadelphia. To this nucleus have been added from time to time still other mills, until now it controls eleven establishments. While the largest single unit of the concern is at Cleveland, oddly enough there has been no success in securing mills near that city.[3] Among the newer plants acquired outright or now under its control, two are in Falconer, New York, and two others in Providence, Rhode Island. At present its equipment includes approximately 185,000 worsted spindles and 1,800 broad looms. Obviously this does not threaten the primacy of the American Woolen Company with its 460,000 worsted spindles, 290,000 woolen spindles, and 9,800 looms. Still, it is a large unit for the worsted industry.

The Company is noteworthy in at least one regard, the extent to which it has carried differentiation among

2. Bulletin of the National Association of Wool Manufacturers, 1900, p. 17.

3. The factor of inadequate labor supply is stated by the Company to have occasioned its expansion to regions other than the original one.

its several plants despite their geographical separation. Only two of its mills contain the whole series of processes, from scouring the raw wool to weaving the cloth. Other mills perform combing, vigoreaux printing, spinning, weaving, or finishing alone, or a combination of two of these stages in the worsted manufacture. It is noteworthy also because of its apparently steady earning capacity — "apparent," because little information is available concerning this enterprise. Dividends of 7 per cent were regularly paid during the period 1902–09, and 8 per cent thereafter through 1917.[4] It is noteworthy, too, that the expansion of the Company has been accomplished without the issuance of preferred stock or of funded debt, additional capital as required coming, it is said, from the concern's own stockholders without the intervention of banks or promotors.

The earning power of the Company, and its general success, are attributable, at least in considerable part, to two factors: the character of the management and that of the products. The dominant personality of the enlarged enterprise was Mr. George H. Hodgson, a man who had secured his early training in the British wool manufacture and who combined unusual technical knowledge with executive ability. He has been considered one of the ablest men in the American industry, and the expansion and success of the Company have been in large measure the result of his guidance.[5] But

4. During the war period profits increased, as they did in practically all wool mills. Dividend rates were not increased, but resort was had to the more dubious policy of substantial stock dividends — 25 per cent in 1915, 50 per cent in 1918, and 5 per cent in 1919. As a result, capital per loom was brought up to approximately that of the American Woolen Company.

5. None the less, the Company seems to have been infected with the same futility as was the American Woolen Company, the desire for foreign markets in the war period. According to its account, "a permanent outlet for Cleveland Worsteds in foreign markets was assured" after considerable effort. Branch offices were established abroad, apparently in South and Central America alone. As was said with regard to the American Woolen Company's venture, the immediate profits may have warranted the effort, but as a "permanent" proposition there is small prospect of success.

the second element has also been of much influence. The Company was originally devoted to the production of serges, one of the quasi-standardized fabrics of the wool manufacture, and, altho it has taken on a substantial production of fancy worsteds, the concern is still one of the important operators in staple goods of wide and relatively steady consumption. Again it is one of the large producers of worsted yarns for both the knitting and weaving trades, another product of the wool working industry, — a "half-product," to be sure, — which is pretty well standardized. Beginning with the sale of occasional surplus production, the yarn department, it is said, has increased six-fold, until it is now considered "a most important part" of the Company's business.[6] If to these two chief factors are added the advantages incidental to large operations, better buying power, and the like, there are obviously sufficient bases for success. They are features which fit in well with the general economic conditions of the country.

IV

United States Worsted Company. More conspicuous in some respects than the Cleveland Worsted Mills Company is the organization which apparently at one time had hopes of rivaling the American Woolen Company. Not only is the name suggestive, but in the early plans of the Company the names of a half-dozen mills are mentioned, together with "three or four other mills" not named.[7] The two concerns, the American Woolen and United States companies, have the similarity that both were by-products of depression, the latter being devised in 1908; that both are primarily New England

6. A publication of the Company, entitled "The Clothing of the People" (1922), p. 27.
7. American Wool and Cotton Reporter, vol. 23, p. 145.

affairs; and that both comprise in some proportion both branches of the wool manufacture, woolen and worsted. Beyond these points similarity ceases.

The United States Worsted Company is really a small organization. It embraces six establishments, but the total equipment is less than that of the single plant of the Atlantic Mills, Providence, R. I.[8] The Company at first included only three mills, none of them large, to which have been added a worsted spinning plant, a dyeing and finishing establishment, and a relatively extensive weaving mill, the latter being built by the Company. But its career has not been a happy one.

Apparently the first few years were not without some success, altho data concerning this period of the Company's existence are insufficient to judge closely. At least, it was stated in 1912 that an audit by Price, Waterhouse & Co. had shown the $210,000 of dividends (7 per cent) on the ($3,000,000) preferred stock to have been "earned and paid." [9] The balance sheet for the Company for 1911, moreover, shows a surplus of $750,000. But this seems to have been the height of the Company's prosperity. In the following year the Company was reorganized, of which the cause was alleged to be only that it had "outgrown its financial resources." [1] The Lawrence Dye Works, previously leased, was incorporated into the Company, and a worsted spinning plant was purchased. The capital was increased from $6,000,000 (all outstanding) to $17,000,000, $9,700,000 of the additional amount bring at once issued. The proportion of prior-lien stock to this total is uncertain, but seemingly the first preferred amounted to $5,000,000

8. From the best available data, it appears that the United States Worsted Company operates less than 50,000 worsted spindles, some 5,000 woolen spindles, and 850–1000 looms.

9. American Wool and Cotton Reporter, vol. 26 (1912), p. 1429.

1. Commercial and Financial Chronicle, vol. 95 (1912), p. 1044.

and the second preferred to $4,000,000. Dividends on the former were cumulative at 7 per cent, and on the latter non-cumulative at the same rate. In addition, $1,300,000 sinking-fund notes were issued at this time. Thus in getting free from a lease and in acquiring an independent source for its worsted yarns, the Company became burdened with extraordinarily heavy fixed and contingent charges, without any marked increase in earning capacity. It was "conservatively estimated" that the earnings of the new Company would amount to $665,000, while charges on the preferred stocks alone would total $630,000, with $350,000 of these cumulative in character.[2] However, earnings do not seem to have approached this mark prior to the war. The first statement of net profits available is for 1914, when they amounted to $241,000, and for the succeeding year they reached only $447,000, in both cases without any allowance for depreciation. Dividends were not paid on any of the stock until 1918.[3]

During the war and post-war periods progress was made toward a sounder basis. The sinking-fund certificates were reduced to $300,000, a surplus of $3,900,000 was built up, and the second preferred stock was redeemed until only $350,000 was outstanding.[4] But the crisis of 1920 caught the Company unprepared, as it caught so many other concerns — not like the American Woolen Company with its reserve set up against "pos-

2. American Wool and Cotton Reporter, vol. 26 (1912), p. 1429. Nevertheless, there are some suspicious circumstances. The statement was made that there was then "little or no market on old United States Worsted preferred"; and Mr. Adie, an experienced worsted manufacturer but heretofore not connected with the Company, was brought into the concern as president, seemingly at the instance of the bankers. See also below as to selling conditions.

3. A stock dividend was made in 1918 to holders of first preferred stock in payment of all accumulated dividends; and subsequently until 1921 dividends at 7 per cent were paid. One dividend of $1\frac{3}{4}$ per cent was paid (1920) on the second preferred stock; and one cash dividend ($1\frac{1}{2}$ per cent) and a 50 per cent stock dividend were made on the common stock.

4. However, first preferred stock was increased by $2,000,000.

sible depreciation of inventory." Notes payable had increased in the statement for December 31, 1921, to $9,800,000; while largely balancing them was the item ($7,230,000) of "profit and loss" on the asset side. [5]

The difficulties of the United States Worsted Company seem to be at least two. First, it has lacked any man with the organizing and administrative ability of Mr. William M. Wood of the American Woolen Company. This was apparent long before the disaster which followed 1920. A very suggestive and appallingly frank statement occurs in the Company's report for 1913:

> Looking back on the past year, it would seem that a great deal has been accomplished toward reëstablishing the United States Worsted Company in the confidence of the trade. The Company, for various reasons, such as the non-delivery of goods as purchased, poorly manufactured goods, unsatisfactory deliveries, etc., was in very bad repute with the trade. The salesmen had to show United States Worsted goods with an apology, and in many cases customers would not even look at the samples of the merchandise, saying that the samples would probably not represent the goods that were to be delivered. [6]

And since that time the quality of management has in a considerable measure brought difficulties on the selling side, according to conservative opinion in the trade. It has been necessary to manufacture an unusually wide range of fabrics, in relatively small lots, and to sell to concerns whose standing was not of the best. It is reported, for example, that one of the unsatisfactory features in the status of the Company after the crisis of 1920 was its inability to secure indemnity for broken

5. The market price of the Company's first preferred stock, which had touched 101 in September, 1918, and 93 in December, 1919, fell to 6½ by December, 1921.

More recently, a scheme for another reorganisation of the Company has been prepared, apparently with a large measure of advice from the bankers, and a representative of the banking interests will have a place as treasurer of the renewed enterprise. Textile World, Dec. 16, 1922, p. 33.

6. American Wool and Cotton Reporter, vol. 28 (1913), p. 344. Curiously enough "good will" was at that time carried on the Company's books at a figure of over $4,000,000, nearly as large as that for real estate.

contracts from the buyers with whom it has been dealing; tho, to be sure, the clothing trade as a whole has been long afflicted by the evil of frequent cancellations. The real source of the trouble, again according to opinion on the street, has been something of the "just as good" or "almost the same" policy which was reported by the Company itself in 1913.

A second factor is of more general significance, tho in a measure connected with the above situation. The United States Worsted Company seems to lack the backbone of strength derived from a large production of staple fabrics; or, at least, it has not maintained the proper balance between the production of such standardized goods and that of goods in which style is the important factor. Soon after the establishment of the Company, it announced its intention "to run out an entirely new line of high-class novelty goods"; and in a later description of its products the emphasis was distinctly upon the fine and fancy character of the fabrics: "fancy worsted men's wear, fancy woolen men's wear, fine dress goods, broadcloths and fancy worsted trouserings, serges, etc." [7] Moreover, in the equipment of the Company's plants, there is a considerable proportion of French worsted to total worsted spindleage. This variety of worsted spinning is adapted to the finer, soft, drapy fabrics for women's wear, and technically seems to me unsuited to economic conditions in this country. The processes must be conducted with more care and skill, the utilization of the resultant yarns involves slower weaving and more careful finishing, and the products generally cannot be turned out in bulk.[8] In the manufacture of such goods, fancy cloths or cloths from

7. American Wool and Cotton Reporter, vol. 23 (1909), p. 940; ibid., vol. 26 (1912), p. 1368.

8. See my somewhat fuller expressions of this view, Quarterly Journal of Economics, November, 1921, pp. 122, 123, and November, 1922, p. 49.

French-system yarns, the small mill has a very fair chance of successful competition. The fabrics cannot be turned out in quantity with standardized operations, and the opportunities for the small mill to hit the right style are nearly as great as those of the larger concern, especially with the modern means of distributing commercial intelligence. Moreover, here the foreign producer has a greater advantage.

V

Combination in the American wool manufacture is of significance for at least three special reasons. First, the experience of the American Woolen Company has demonstrated that this form of industrial organization may be attained in the textile industry with a fair amount of success. The apparently close connection between combination and frequent reorganization, which has appeared in the cotton combinations, is not inevitable. The "big company" has been able to maintain, improve, and extend its organization, until it is of prime importance in the American wool-manufacturing industry. It has established and maintained a high measure of efficiency, and its labor and marketing policies have been a driving force in the industry. While the exact measure of its financial success is, and seemingly must remain problematical, still it has never been in danger of dissolution or reorganization, and by conservative management in the distribution of its profits and in the building of its mammoth new plants, as well as by the fortunate acquisition of new capital just before the crisis of 1920, it has been able to consolidate its financial position and make its future promise further success. Likewise, in so far as the problem of the American Woolen Company has been that of large-scale opera-

tion, the experience of the Cleveland Worsted Company goes to substantiate the fact that such operation is possible and profitable in the American wool manufacture. In only less degree, the success of other groupings of mills, such as those around M. T. Stevens & Sons Company, bears witness to the same effect.

The experience of the American Woolen Company is of added interest since no combination of its particular character has been developed abroad. The woolen branch of the wool-manufacturing industry in foreign countries embraces no combination of moment; and in the worsted branch, probably by reason of its extensive differentiation there, combination has been of a limited variety, comprehending concerns which carry out a single process or at least only a few related processes. The Woolcombers, Ltd., and the Bradford Dyers' Association may be instanced in the English industry; and in the German manufacture the numerous kartells that have arisen in the various wool-working districts.[9] On the other hand, there are, at least in the English industry, several cases of agglomerations or the development of large-scale management, such as the Cleveland Worsted concern in this country. Men of outstanding ability, as, for instance, Sir Francis Willey and W. C. Gaunt, have gradually acquired miscellaneous groups of wool-dealing and wool-manufacturing plants, until their enterprises now stand out as important factors in the British industry.

Finally, the history of the American Woolen and of the other consolidations suggest the essentials for advantageous operation of this industrial form. The American

9. In addition to the more definite combinations in the British trade mentioned in the text, there are frequent rate- or price-fixing associations in various sections of the industry, e. g., the carbonizers' association, the commission weavers' association, and the blanket manufacturers' association.

For the German situation as it existed prior to the war, see Bachmann, Organisationsbestrebungen in der deutschen Tuch- und Wollwarenindustrie (1915).

Woolen Company, like the United Drug Company, is essentially a one-man concern, and only a man of extraordinary executive ability and sound judgment could develop either company in the way it has been developed. In exceptionally good management the Cleveland Worsted Mills Company has also shared. Second only to this personal factor is the possession by the American Woolen and Cleveland Worsted companies of a large output, a substantial backbone of standardized or semi-standardized products, and the refusal of the companies to go far into the manufacture of those highly speculative fabrics where style is the predominant element and small-scale production the necessary concomitant.[1] It is worth while to note once more that such staple products are of greater prominence in the worsted than in the woolen branch of the industry. Perhaps for this reason no large-scale operations have been attempted in the woolen branch alone—a fact which in itself would tend to support the contention here made of the importance of staple products to large-scale operation and successful combination. Perhaps without the two essentials above indicated, few "combinations" have ever been successful.

It is noteworthy, however, that these organizations in the wool manufacture have had none of the advantages, artificial or otherwise, to which Professor Jones attributes in large measure the success of other combinations with equally fortunate experience.[2] They have enjoyed

1. It was recently stated by the Company that "fully 70 per cent of American Woolen fabrics are dyed blue." Outlook, January 10, 1923, an advertisement by the Company. Such fabrics, of course, include the most standardised goods in the wool manufacture.

However, it may also be noted that the Company has of late years accompanied the whole American wool manufacture into the production of goods employing French-spun worsted yarns, which, as already noted, are not as advantageously produced or manipulated. The present Shawsheen project embraces an addition to its spinning capacity in this line. Yet, despite this new development, the firm foundation of a large standardised output remains.

2. Jones, The Trust Problem in the United States, pp. 539–541.

no significant patent or copyright monopolies; they have no basis in the control of limited natural resources, nor have they been recipients of transportation favors. Furthermore, it can hardly be maintained that they have derived any appreciable strength from that final factor in Professor Jones's category, the possession of a specially efficient plant among its combined establishments, such as the Carnegie works in the steel combination, which would to a considerable extent swing the whole enterprise. Indeed, it is the more remarkable in the case of the wool-manufacturing organizations that, lacking any of these favorable factors, they have still attained as substantial success as they have. Perhaps without the exceptional leadership and the direction of production largely to standard fabrics, they too would have undergone the difficulties which have afflicted the combination in the kindred manufacture of cottons.

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FURTHER EVIDENCE ON THE RELATION BETWEEN PRICE, COST, AND PROFIT

SUMMARY

The problems and the nature of the available statistics. — Evaporated milk, 480. — Crude oil, 482. — Beet sugar, 483. — Farm implements, 487. — Results, 489.

In the *Quarterly Journal of Economics* for February, 1921, I presented and analyzed fourteen cost distributions, representing the costs in different years for six industries. A summary of the conclusions drawn from those figures is repeated here for the reader's convenience.

The deductions to be drawn from the material here presented are only tentative. Cost groups of this kind should be so presented in the future as to enable investigators to identify (if only by number) the different producers represented, and particularly those at the bulk line. The investment for each group of producers should be indicated, as in the copper figures shown above. More data must be available before final conclusions can be presented. During the war the Federal Trade Commission obtained costs for a number of industries. These are being published, but are not entirely suitable for the present purpose because the prices for the industries represented were not competitively determined, but fixed by the various price-fixing agencies,[1] and for the further reason that investment figures are not usually given. If the conclusions to be set forth in the next paragraph are not borne out by further investigation, all that the writer can claim as the *raison d'être* of this paper is the method of inquiry which it sets forth.

From the figures presented it appears that, if the average return on investment is an index of normality, in no case were the industries represented operating under absolutely normal conditions of com-

1. This is not so serious a difficulty, in that the relations of cost, price, and return on investment can be demonstrated even for a period of price-fixing.

petition. However, in those years which were more nearly normal, price was in practically every case considerably above the modal or average cost, and approximated, generally speaking, the bulk-line position. This was as true of the manufacturing as of the extractive industries, and as true of the smaller dispersion group as of the larger dispersion group. Book-print paper in 1916 is the one case where, even with a high return on investment, the price was not much above the marginal or bulk-line cost. This may be explained by the small degree of dispersion for the costs of the industry in that year. More data may bear out the contention that the price-cost relation is affected by the degree of dispersion of the costs. Until such data are procurable, the generalization to be drawn from these analyses is as follows. Price approximates bulk-line or marginal cost under normal conditions of competition, that is, when the total gross profits (including interest and profit) of all the producers in an industry amount to approximately 10 per cent of the entire capital invested in the industry; and price is higher or lower than bulk-line cost whenever the return is greater or less than approximately 10 per cent.

Since the article quoted above appeared, the Federal Trade Commission has published figures for other industries. These furnish new evidence on the relation between cost, price, and investment, and throw some light on one or two of the related problems suggested in the earlier study. Before attacking the principal problem and before presenting the statistics to be used, it will be interesting to consider some of the related problems.

In the article referred to above, in a still earlier article of mine in this Journal,[2] and in an article by Professor Taussig,[3] the concepts of marginal cost and of bulk-line cost were considered. The question arises whether there is a marginal producer or a marginal group of producers who hang on for successive years, or whether we must abandon the concept of the marginal producer and hold to the concept of marginal cost. This is part of a larger problem, the solution of which has a practical impor-

2. "Price Fixing and the Theory of Profit," November, 1919.

3. "Price Fixing as Seen by a Price Fixer," February, 1918.

tance probably greater than that involved in the discussion of a theory of profit. The larger question, of which that concerning marginal producers is merely a part, is whether particular companies tend to keep their same relative positions in the cost groups from year to year.

Let us consider for a moment the practical importance of the solution of this problem. A clever lawyer arguing before the Trade Commission stated the apparent paradox that there is in competition a tendency toward monopoly. What he meant was that, assuming the law of increasing returns, the lower-cost businesses would become larger and more efficient and could thus continue to reduce their costs, undersell their smaller competitors, until finally monopoly would prevail. The argument is familiar to the economist, but contains two latent assumptions with which he might quarrel.

The first concerns the inevitableness of the law of increasing returns. Mr. Kotany, in this Journal for May, 1922, points to the Trade Commission reports, which show that the law is not always relentless. When I was with the Trade Commission I was constantly on the lookout for statistics which would help in this problem. In the Milk Report, which Mr. Kotany quotes, we noted that the lowest-cost companies were not always the largest companies. Probably the most interesting figures were those in the Salmon Report, in which it was shown that the larger plants had on the whole the lower costs, but that the largest companies, which were often combinations of large and small plants, were not the lowest-cost companies.[4]

This, however, is not the only assumption in the argument. It assumes also that the low-cost companies of one year will be low-cost companies of another year, and

4. Federal Trade Commission Report on Canned Salmon (Dec., 1918), p. 46.

more generally, that all the companies will tend to keep their same relative cost positions year after year. The designation of the different companies by number, and the presentation of the individual costs in some of the latest reports of the Trade Commission throw some light on this problem.

The statistics that follow will also be of value in testing certain assumptions which I have been forced to use. For example, an *average* price for an industry as a whole has been assumed in establishing the price-cost relation. When prices are not widely dispersed, because of keen competition and the sale of the bulk of the product in one market, the assumption is not a bad one. However, producers seldom if ever walk into market arm in arm, bringing with them their year's production, and there meet all possible buyers, who stand ready to absorb the total output at the "market price." If such an artificial situation should ever exist, a single price would be expected, and the only profits to emerge would be those due to differences in costs. It is curious that the average of rather widely dispersed prices has so often conformed to the place in the cost group which the return on investment would indicate.

Another assumption concerns the relation between cost and investment. In the studies made, an average investment in the industry as a whole has been assumed, in order to estimate the probable interest on investment to be allowed before comparing price with the bulk-line costs. The question arises whether the high-cost companies have lower investments per unit of product than the low-cost companies. From general considerations this might be thought logical. Too few of the Commission's cost studies give separate investment figures for each company. The few figures available will be presented for the small evidence they offer.

The statistics taken from the Trade Commission's reports on canned milk and California crude oil, which can be used only for the analysis of the relation between price, cost, and return on investment, will be given first. The beet-sugar and farm-implement figures will then be presented to show with what persistence the different producers in these industries maintained their cost positions from year to year.

Evaporated Milk

In the Commission's Report on Milk and Milk Products there is only one cost series for evaporated milk. This is for the year 1918. As a matter of fact, the Commission had figures for the years from 1914 to 1918 which illustrated admirably the relation between price and cost. From a study of the relation of the average prices to the cost series, I was able to anticipate with a high degree of accuracy what returns on investment were realized for each of the five years from 1914 to 1918. Unfortunately, these figures (for no stated reason) were not presented in the Commission's report when finally published. Furthermore, in the figures for 1918 the investments per unit of product were not presented in such a way as to serve their best purpose.

It can be estimated roughly that the average investment was slightly less than $2, and that the average interest charge to be allowed should be between nine and ten cents. It appears that probably less than 50 per cent of the production was produced at a gross profit large enough to cover the interest charge and leave any pure profit. As is well known, this was a very bad year for the evaporated-milk industry. The condensed-milk manufacturers, it may be noted, did not have so much trouble with the export restrictions as the evaporated-milk canners and earned better returns. On page 45 of

The figures for 1918 are: [5]

Number of company	Cumulative percentage of production	Total costs	Selling price per case	Profit or loss per case
1	3	$4.55	$4.74	$0.19
2	6	4.85	....	....
3	6	4.89	5.38	0.49
4	25	4.89	4.87	0.02[1]
5	28	4.89	5.05	0.16
6	31	4.96	5.06	0.10
7	33	4.97	5.13	0.16
8	34	5.00	4.57	0.43[1]
9	38	5.02	5.42	0.41
10	39	5.04	5.44	0.40
11	40	5.06	4.59	0.47[1]
12	41	5.07	5.31	0.24
13	41	5.09	5.36	0.27
14	41	5.08	5.46	0.37
15	43	5.11	....	....
16	44	5.18	5.34	0.16
17	48	5.21	5.33	0.12
18	50	5.25	5.89	0.64
19	51	5.26	5.04	0.22[1]
20	51	5.27	5.13	0.14[1]
21	51	5.29	5.06	0.23[1]
22	51	5.29	4.87	0.42[1]
23	57	5.30	....	....
24	57	5.31	....	....
25	58	5.31	5.22	0.09[1]
26	59	5.34	5.55	0.21
27	69	5.39	4.88	0.51[1]
28	70	5.49	5.57	0.08
29	98	5.62	....	....
30	98	5.63	5.78	0.16
31	98	5.65	4.29	1.36[1]
32	99	5.69	5.37	0.32[1]
33	100	5.94	5.32	0.62
34	100	6.02	4.69	1.33[1]
35	100	6.20	5.88	0.32
36	100	6.31	4.78	1.53[1]
All companies	....	5.24	....	....
31 companies [2]	....	5.10	5.03	0.07

1. Indicates loss.

2. Reporting selling prices.

5. Appendix, Table 13, p. 194.

the Report it is shown that the companies engaged in the manufacture of evaporated milk averaged only 4.1 per cent on their investment.

Crude Oil in California

The Commission's Report on the Pacific Coast Petroleum Industry gives figures for the years from 1914 to 1919, but only the 1918 and 1914 figures are presented in such a way that they can be used here. The costs of 1918, in Table 48 on page 128, can be arranged as follows:

Costs (per barrel)	Percentages produced	Cumulative percentages
$.000– .305	42.1	42.1
.305– .420	12.8	54.9
.420– .485	18.9	73.8
.485– .568	15.3	89.1
.568– .800	5.8	94.9
.800– .991	2.1	97.0
.991–5.365	3.0	100.0

The price (per barrel) in 1918 was $1.15 for oil under 18° Baume gravity, $1.22 for oil of 24°, and $1.28 for that of 27°. Assuming an average price of $1.22, and making allowance of $.15 for interest on investment, the net price of $1.07 covered practically 97 per cent of the production. The average earnings on investment in 1918 were over 24 per cent.

The costs for 1914 are given in Appendix Table 29 of the Report. They are as follows:

Costs (per barrel)	Percentages produced	Cumulative percentages
$.031– .165	29.8	29.8
.165– .246	19.5	49.3
.246– .288	9.6	58.9
.288– .321	10.9	69.8
.321– .372	10.3	80.1
.372– .423	7.2	87.3
.423– .457	8.1	95.4
.457– .691	2.5	97.9
.691– .878	1.1	99.0
.878–1.961	1.0	100.0

The average price in 1914 probably approximated $.48. Deducting an interest charge of about $.12, the net price would be $.36. Thus the price in 1914 covered only 80 per cent (or less) of the costs in that year. The average return on investment for the industry as a whole was only about 7.6 per cent.

Beet Sugar

In the article already referred to the costs of producing sugar beets were presented. In the same report from which the statistics were taken, there are figures for the cost of producing sugar from the sugar beets. Altho the sugar costs are not given for separate years in a way to suit our purpose, average costs for a series of years are given and can be used to advantage. Indeed, if the theories of interest and profit presented or implied in my first article are sound, average returns on investment over a series of years can be expected to accompany normal relations between cost and price. The following figures furnish some evidence that they do.[6] They show

Average cost of different cost groups	No. of factories in the group	Percentage of total sugar produced by group	Cumulative percentages
$3.23	15	38	38
3.60	11	21	59
3.96	17	25	84
4.84	21	16	100
3.74[7]	64	100	100

the average net cost per 100 pounds of sugar, and the percentage of the total sugar produced during the five years ending with the campaign of 1913–14, for 64 factories grouped according to the net cost of production.

6. Federal Trade Commission's Report on the Beet Sugar Industry in the United States (1917), p. 85.

7. This average is slightly inaccurate because the percentage weights have been adjusted in such way as to make up a total of 100.

As the figures include no selling expense or interest, allowances for these two items should be made in the average price. The average selling price per 100 pounds for the five years considered was $4.9277; but when the "cost of selling" is subtracted, the "net price at factory" is $4.50.[8] Altho no figures for investment per unit of product are given, from certain data in the report the limits of interest on investment per 100 pounds produced can safely be estimated at between $.35 and $.45. If an interest figure be deducted from the average price (minus selling expenses), it will be evident that the net figure is about $4.10. Thus, price covered the third group (the group which averaged $3.96) and probably fell in the upper part of the last group. It seems safe to conclude that between 85 and 90 per cent of the total was produced at no loss. This might well be called the bulk of the product. According to the conclusions drawn from other industries, the return on investment might have been expected to range anywhere from 9 to 13 per cent; as a matter of fact it was slightly over 11 per cent.[9]

Turn now to the question of the existence of a marginal group of producers, and of the persistence of the different companies in their cost positions from year to year. The beet-sugar report contains figures from which the table on page 485 is constructed.[1]

A simple statistical device will enable the student to measure the persistence of the different companies in their cost or profit positions. If a company moves from the group of lowest earnings (0–2.5 per cent) in 1909–10 to the second group in 1910–11 (2.5–5 per cent), the change may be said to be 1; if in the next year the company moves to the fifth group (10–12.5 per cent), the change may be measured at 3. These changes can be averaged, and used as an index of profit regularity or

8. Page 145. 9. Page 130. 1. Page 130.

Percentages earned on investment	Numbers used to designate companies					Average for five years
	1909–10	1910–11	1911–12	1912–13	1913–14	
2.0– 2.5	10, 14, 17, 27, 35	10, 14, 17, 27, 35, 6, 21, 4, 3,	10, 14, 35, 1, 2, 3, 7, 9, 13, 20	14, 17, 35, 1, 2, 5, 6, 7, 9, 12, 13, 16, 20, 34	10, 14, 17, 35, 1, 2, 3, 4, 5, 6, 7, 9, 13, 18, 20, 22, 34, 16	10, 14, 17, 35, 2, 3, 6, 7, 9, 13, 20
2.5– 5.0	6, 21, 29, 36	9	12	3, 10	21, 24, 26, 27	1, 4
5.0– 7.5	2, 20, 22	7, 13	5	4, 21	19, 29, 30	16, 21, 27
7.5–10.0	9	2, 16, 20	6, 16, 21	19, 22	5, 12, 25	34
10.0–12.5	....	24, 30	4	....	....	5, 12, 22, 29
12.5–15.0	3, 7, 13, 30	1, 5, 29	27	27, 30	....	30
15.0–17.5	34	34	29	24	....	24, 36
17.5–20.0	1, 19	12, 25	34, 36	29, 36	36, 37	19
20.0–22.5	2, 16	22	30	....	....	....
22.5–25.0	5, 24	36	....	....	....	18, 25
25.0–27.5	18	....	....	....	....	....
27.5–30.0	37	19	24	....	....	....
Over 30.0	12, 26	18, 37, 26	18, 19, 22, 25, 26, 37	18, 25, 26, 37	....	26, 37
Average percentage earned on investment	16.3	14.4	15.6	9.0	3.7	11.6

variability. The only companies that showed no change of group were Companies 14, 17, and 35. All these companies failed to earn enough even for interest. Company 10, too, was an unprofitable company and showed only one change of group in 1912–13. Companies 9, 20, 21, and 27 might be called marginal companies; indeed, all of the companies mentioned so far were hanging on the margin and might be classed as a marginal group. Companies 7 and 13 would have been relatively profitable had not the general depression in the last two years set back the great bulk of the industry.

An interesting question arises as to whether there are any so-called representative producers. In Companies 34, 5, 12, 22, 29, and 30 the average returns on investment were from 7.5 to about 13 per cent.[2] Yet every one of these companies showed great variability. Company 22, for example, was in the third group in 1909–10, in the ninth group in 1910–11, in the last group in 1911–12, in the first group in 1913–14. It happened that these violent fluctuations averaged 10.2 per cent; the same is true of Company 12. Companies 29 and 30 more nearly fit the definition of representative companies as far as earnings are concerned, but even their position was not very stable. Indeed, there is less evidence of a group of consistently representative producers than there is of marginal producers for the industry during this period, which in some respects was very normal.[3]

There were a few very profitable companies that maintained their favorable positions with considerable regularity. Companies 37 and 25 showed consistently good profits, and Companies 18 and 26 were set back only once, in the bad year of 1913–14. Yet companies

2. Company 30 showed an average of 13.3 per cent.

3. Normal, because the general price level, which had been rising since 1896, reached a plateau between 1909 and 1914 in which there was practically no trend upward or downward.

which showed very small profits in some years were able to advance to very profitable groups in other years: such as Companies 22, 36, 29, etc.

On the whole, it appears that a considerable number of the companies retained the same general cost positions, but that a bad year forced most of them back into lower profit groups. This does not mean that their positions are rigid, for many companies which are high cost in one year become low-cost companies in other years, and *vice versa*. There is some evidence for the existence of a marginal group; this may be due to the rather bad year 1913–14 and the extraordinary dispersion of 1911–12 and 1912–13. There is no evidence for a representative group; for most of the companies showing average returns, such returns were chance resultants of widely varying profits.

Farm Implements

Altho the Federal Trade Commission's Report on the Causes of High Prices of Farm Implements contains no unit-cost figures of the kind shown for some of the other industries, it gives a record of the gross profit earned on investment by each company through the five-year period, 1913–18. Most of the farm-implement companies make such a varied line of articles that any attempt to distribute the overhead and work out comparable unit costs would be futile. The table on page 488, where the companies are arranged in the order of their profitableness, will serve some of the purposes of a cost table.

It might appear that lines drawn between the companies which earned a gross profit and those which did not would locate the marginal producers. However, it should be remembered that the marginal producers earn interest, tho not profit. Therefore, those companies which earned just about 4 or 5 per cent are the marginal

1913		1914		1915		1916		1917		1918	
Co. No.	Per cent	Co. no.	Per cent	Co. no.	Per cent	Co. no.	Per cent	Co. no.	Per cent	Co. no.	Per cent
2	−7.94	23	−13.00	23	−16.60	23	−10.06	23	−8.91	2	−2.04
16	−2.02	2	− 9.75	13	−11.44	2	− 6.51	2	2.61	10	*4.05
6	−1.32	1	− 6.07	16	− 6.42	13	− 5.24	19	*5.03	19	9.76
26	−0.95	19	− 4.15	2	− 4.60	19	0.29	13	8.08	15	12.18
24	−0.38	16	− 3.44	6	− 4.33	16	*4.47	15	8.39	1	16.31
23	2.05	26	− 1.43	1	− 3.36	4	*4.69	3	8.62	4	16.56
13	2.53	6	− 0.55	12	− 3.04	24	*5.20	20	9.39	20	17.11
1	3.22	24	0.19	14	− 2.20	20	6.53	24	11.10	3	19.62
4	3.29	17	0.33	19	− 1.17	1	7.13	17	12.65	11	19.66
19	*5.03	13	1.07	17	− 0.59	6	8.03	1	12.76	21	19.73
5	*5.62	7	2.58	24	1.66	17	8.62	4	13.54	22	20.63
14	7.92	12	*5.22	26	2.83	15	9.63	26	14.17	6	22.33
17	7.92	3	*5.51	25	3.16	14	10.18	10	15.69	13	24.01
11	8.48	20	*5.60	20	*4.12	8	10.29	21	18.61	16	26.29
12	8.72	4	*5.68	3	*5.66	26	10.90	11	18.67	14	32.68
20	9.56	21	*5.72	4	6.90	3	10.94	6	20.39	17	34.02
10	9.69	11	7.05	15	7.69	7	11.65	22	20.42	18	40.96
22	10.93	14	7.67	11	7.83	22	11.79	14	20.93	5	42.61
21	11.05	22	7.97	22	8.68	11	12.14	18	21.36	7	49.67
7	11.95	15	8.68	8	9.09	12	12.16	7	23.53	9	53.89
5	13.49	5	8.81	21	9.59	25	12.61	8	26.11	12	58.80
18	14.18	8	9.45	7	10.55	18	13.44	16	26.32	8	70.52
8	15.91	25	10.92	18	10.77	21	14.22	12	30.23	..	....
25	16.52	18	13.21	5	17.29	10	22.91	5	34.35	..	....
3	20.36	10	17.06	10	24.20	5	27.89	9	46.78	..	....
9	41.14	9	33.36	9	32.27	9	39.59	25	50.12	..	....
Average return on investment	10.21	..	6.40	..	7.22	..	10.88	..	18.26	..	21.10

ones. (The marginal companies are those marked with stars.) It should also be noted that the position of the marginal group in each year is roughly that which the average return on investment would indicate. In 1913, for example, the position of this group was higher in the table than in 1914, and the average return in 1913 was 10.21 as compared with 6.41 in the following year.

There are one or two companies which approximate with some consistency the marginal position, e. g., Company 4 in the first three years, and Company 19. But there is no well-defined marginal group. If the representative company of any one year is supposed to earn approximately 10 per cent, then there is no well-defined group of representative companies. If, however, the average return for any one year is taken to be the percentage earned by the representative company, then there are certain companies that occupy the representative company position with some regularity, such as Companies 21, 22, 11.

The principal result of the foregoing analysis is identical with that of the article the conclusions of which were quoted as a preface to this paper. The relations between price, cost, and investment have been found to be the same for these as for the industries studied in the earlier paper.

The other questions on which the meagre figures available throw some light concern the persistence of the various companies in maintaining their same relative cost positions, the dispersion of the prices realized, and the relation between the size of the unit costs and the size of the unit investments. More figures must be compiled before any certain generalizations be can reached. The tentative conclusions from the inadequate data might be summarized in the following statements.

Many of the companies may maintain approximately their same relative cost positions year after year; but the possibility of companies varying from their usual position should not be overlooked. One conclusion is reasonably certain: the large companies are not absolutely assured of a consistent low-cost position.

The representative character of an average price depends upon the dispersion of the prices and upon the existence or non-existence of a well-defined mode. The danger of considering an average price as an entirely representative price is evident. Again, it would appear from purely deductive logic that the low-cost company should show a large investment per unit of product and the high-cost company a small investment. The few figures given do not bear out such a deduction in any marked degree.

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DANISH AGRICULTURE WITH SPECIAL REFERENCE TO COÖPERATION

SUMMARY

Shift in relative prices of grain and of animal products during the last 250 years. — Acceleration of the change in Denmark since 1880, 493. — England and Germany as markets, 495. — Intensive cultivation requires careful accounting; its promotion in Denmark, 497. — Imports and exports, 500. — The growth of coöperation; dairies, marketing associations, savings banks, credit associations, 501. — Exceptional coöperative spirit in Denmark, 505. — The Danish small farmer, 506.

THE channel into which Danish farmers direct their production is, of course, determined by the prices of agricultural staples, and therefore it has changed very much in the past centuries. We are so fortunate as to have preserved exact figures for the prices of the leading articles for 250 years, and in that long period there has been a nearly uninterrupted clear tendency, namely, that the prices of manufactured animal products have become more favorable in proportion to the prices of grain. In the period 1661–80 the price of a certain quantity of butter was 11 times the price of a certain quantity of grain; a hundred years later 16 times; in 1876–80, 20 times; in 1901–05, 27 times; and the price of bacon has moved nearly parallel to that of butter. For the 125 years before the war, beginning with 1788, the great year of independence of the Danish peasants, five years after your great year of independence, we also have figures for wages, which show that from 1788 to 1913 the wages of agricultural laborers increased in the ratio of 1 to 4. Meanwhile the prices of butter and

bacon increased in the ratio of 1 to 3, but grain prices in the ratio of 1 to 2 only. Accordingly Danish farmers have directed their production more and more towards butter and pork, while the sale of grain is now of little importance.

The chief causes of this development in relative prices have been three: (1) that the progress in grain production has been faster than in animal production, (2) that the increasing prosperity in the world has increased the demand for refined food, (3) that the increase in wages has increased the cost of production of this refined food. And it is worth while to note that the increasing prosperity of the laborers has gone on contemporaneously with an increase in land rent. You know from Ricardo that when rent rises, the condition of laborers declines, but that progress can reduce rent again. Here in the economic history of Denmark we have evidence that progress can favor the laborers and nevertheless permit rent to rise. This is because we now produce more on inferior soil than we formerly produced on the fertile, and still the fertile soil has a surplus in proportion to the inferior.

The speed of this movement was greater about 1880–90, when American competition appeared in the grain market. It was several years before the farmers on the prairies began to have much live stock, and therefore their competition at first was felt only through grain prices, while the prices of butter and pork remained the same. In this period a play on words came into use among the Danish farmers; they called the movement a "cow-turning," a turn to keeping many cows, while the same word is used among our seamen for that sudden turning of a sailing vessel which you call a "tack." But in fact the movement was not sudden; it was only an acceleration of a movement that had been going on for

scores of years, and had been especially strong since the end of the sixties. At that time the export of grain reached maximum; and by the year 1880 export had decreased so fast, and import had increased so fast, that the two were equal. This was due partly to the price movement and partly to the fact that our farmers had exhausted the natural fertility of the soil: since they sold their grain instead of feeding it to the cattle, a scarcity of manure resulted, and the fertility of the soil was not replenished.

For many years the leading farmers and the professors of the agricultural schools had warned them against this exhausting process; and so when the American competition began, about 1880, the farmers were ready for an acceleration of the movement. Here, as elsewhere, it is much easier to accelerate a movement which has already shown good results, than to start a real "cow-turning." Only in the building of dairies was the movement sudden; 600 of the 1200 coöperative dairies were built in the period 1886–90.

As already mentioned, the price movements of butter and pork for many years were nearly parallel; but since the competition of margarine has begun, the prices of pork and meat have been relatively more favorable, and therefore a new, but weaker, turning has developed. Butter is still the greatest export article, but not so predominantly as before. Thirty years ago pork and meat were a necessary evil, a mere by-product; the farmers were compelled to raise hogs in order to make use of the skimmed milk, and when the cows became old, they had to be slaughtered. But in the new century prices favored a deliberate production of hogs. The number of hogs increased enormously, and in the breeding of horned cattle more stress was laid on meat. We have here an example of what theoretical economics calls

joint supply (joint production), in which the proportion between the quantities of the two products, butter and meat, can be altered according to prices. In some districts they now have more shorthorns, and everywhere the number of calves, bulls, and bullocks has increased in proportion to cows. As an especially clear illustration of the altering of the proportion of the joint products, I can mention the fact that the number of old cows has decreased rapidly. This means that the number of years in which they are used for the production of milk is decreased, while each cow still gives a whole carcass.

I return now to the history of our prices. You may ask where we obtain price statistics as far back as 250 years ago, and in some cases still further back. The answer is, from the tithe and other church taxes. The church had early instituted an annual statement of the prices of the most important products, and later the state continued the system. I may here add the remark that statistics are greatly indebted to taxes. Thanks to taxes we have statistics of income, of population, property, imports, consumption, restaurants and saloons, amusements, and now at last of the value of the soil. Twenty years ago we levied a tax on the whole value of real property, but now in 1922 we have levied a tax with different rates for land and buildings; and in order to calculate beforehand the probable results of this reform it was necessary to institute a special valuation of the soil. This will probably be the only contribution of the single-tax movement to statistics. The single-tax movement, which is rather strong in Denmark, and whose agitation we may thank for the law of 1922, is, in contrast to the socialist movement, very little interested in statistics, and of course a single tax can give statistics only on that particular point, while the centralized organization of the socialists requires many more statistics.

As one of the clear statistical results of the taxes, we have the above-mentioned prices of agricultural products, showing a nearly constant movement in favor of animal products. The direction and the methods of production have altered accordingly. When the prices of butter, pork, and meat were low, grain was used only to a very small extent as raw material for these articles, and special production of feeding stuffs did not exist. One hundred and fifty years ago we had no grass fields, but only natural grazing lands; we had no clover, no beets, and the only special production of feeding stuffs was of oats for the horses and of hay from natural meadows. The cows of that time got no rich food, and the hogs had to find their food in the woods. But later, when grain prices became low, and the prices of animal products became higher, the cattle got more and more grain, and a large production of planted grass and of beets took place; at first only grass and clover, but as this is a rather extensive form of cultivation, the grass fields have since diminished and the beet fields have increased so fast, that now they make up about 10 per cent of the total agricultural area, giving nearly twice as much food per acre as grain does, and more than twice as much as grass.

As to markets, Denmark has a very good position between England and Germany, and rather near each of these great industrial countries. Before the war England got most of our butter, pork, and eggs, while Germany got horses, cattle, and meat. The share of England was greatest, but the share going to Germany was increasing, and if the war had not come, perhaps Germany might have grown to be our largest customer. But now the misfortune of Germany causes our farmers great losses, especially in those districts where they breed horses and shorthorns. Even the English market

is weaker than before the war, but, among other new markets, the United States has occasionally been of importance for our butter export. The weakness of the English market is partly due to increasing consumption of margarine, which they learned during the war. At that time Denmark was not allowed by the allied countries to buy raw materials for margarine, and therefore we had to eat our own butter, which caused our consumers enormous expense, while the English consumers, on the other hand, made a corresponding saving in consuming margarine in place of butter, a habit which they have partly kept since the war.

As an illustration of how the Danish farmers alternate between the English and the German market, I can mention the fact that in olden times Germany (and Holland) was the buyer of our cattle and meat, but from about 1850 the market was England. This lasted forty years, until England in the nineties began to get her meat from the southern hemisphere, and the great industrial development of Germany increased her demand for imported meat.

Very often Danish agriculture is called a kind of industry, because the stress is laid on refined articles, and because we not only use our own feeding stuffs, but also enormous quantities of corn from North and South America, barley from the Black Sea, and oil cakes from America, Russia, and East Asia, etc. While our own production of grain is on the average 2.3 million tons, our net import of grain, oil cakes, and bran before the war was 1.6 million tons, and the captains of the ships often wondered how this little country could consume such enormous quantities. The explanation is that the live stock consumes 82 per cent of the total of 3.9 million tons, while 5 per cent is used as seed corn, and only 13 per cent for bread, beer, spirits, etc.

This international division of labor by which countries in the neighborhood of the densely populated industrial countries of Europe carry on intensive agriculture with great purchases of imported feeding stuffs, as well as of artificial fertilizers, is quite natural. Agricultural prices are higher and wages are lower; hence an intensive cultivation is economical. Now you know that when cultivation becomes more intensive, we meet the law of decreasing returns. But this law is especially valid as to grain. It is difficult to increase the harvest of grain through more labor, but in our climate more labor, as well as more fertilizer, can be utilized in an excellent way through beet-growing, either for sugar production or for cattle. It is especially natural that a great part of the labor engaged in feeding cattle should be in countries with proportionally low wages, and then we do not meet the law of decreasing return at all. Finally, the manure as a by-product of the cattle-breeding has more value in these countries, and probably the cost of transportation from distant countries to Europe is lower for grain than for the corresponding quantities of finished perishable products.

With such intensive cultivation the net profit is low in proportion to the gross receipts, and therefore the net profit is very sensitive to price fluctuations and to the mistakes of the farmer. That kind of farming requires much intelligence and much calculation by the individual farmer, and many educational experiments on the part of the public. The Danish government has spent much money in such experiments, dealing with the crops as well as with the cattle, and the farmers unions have also been much interested in them. The newest field for such activity is coöperation in bookkeeping through hired advisers. Agricultural bookkeeping is the most difficult of all bookkeeping, while that of mer-

chants is the easiest, with industrial bookkeeping between these two. Merchants sell their commodities in the same shape as they buy them, and manufacturers can often to a certain degree calculate their costs by adding the raw materials, the wages, etc.; but the farmers are always engaged in so-called joint supply or joint production, that is, the different branches of their production are so connected with each other, that it is often nearly impossible to calculate the exact prices of the separate products. Therefore, the farmers want advisers to assist them with their bookkeeping, and several able men are now in such positions. Some of our leading farmers believe that the final objective is to get all farmers to keep books, but in my opinion it is sufficient that about 10 per cent of the farmers keep really instructive accounts with proper divisions for the different branches. Such bookkeeping requires so much work and so much sense of order, that it is impossible and superfluous to obtain the participation of all. Only an ordinary cash account can be expected of all, while detailed bookkeeping would often give results that would be less instructive than common sense. If we have 10 per cent keeping good accounts spread over the country, and amongst the different-sized farms, their results may be useful even for the others, and the number will be quite sufficient for very instructive statistics.

In the interpretation of these accounts several difficult questions arise. In 1910 there was a great discussion over the profitableness of dairy farming, but it came to no result, because the experts could not agree on the cost of production of the beets. Another problem, which I shall treat more in detail, relates to the value of the manure, which under Danish conditions constitutes a not unimportant part of the revenue of dairy farming. The official experiments showed that a certain quantity

of manure (4533 kilos per hectare) increased the crop from 2121 to 2830, or by 709 units (kilos of grain or equivalent) while another quantity added only 355 units, and a third only 265 (total, 3450 units). Now some were of the opinion that the real value of the manure was expressed by the first 709 units, while others regarded the last 265 as the correct figure. To those who are familiar with the doctrine of marginal utility from political economy (and I may here add the personal remark that my subject at the University of Copenhagen is not agriculture but statistics and economics), it will be clear that the question depends on how much manure the farmer has. If the problem for him is whether he shall increase the number of his cows from 15 to 18, then it is the manure of the three additional cows which we must consider. There is no doubt as to the 15 cows; their manure has probably a great value, but on that assumption the additional manure has a much lower value.

Several other illustrations of this theory may be found in the reports of agricultural experiments. For example, the fact that mixed fodder has the greatest value agrees with theory. And as to the beets, we have interesting experiments showing their value as fodder as compared with grain, but originally only when used in moderate quantities. Now it has come about that with a great harvest there is sufficient quantity to permit a much greater consumption of this perishable fodder, and then the marginal utility of the beets is much lower; therefore, a new series of experiments has been arranged, and I hope we shall at last be able to give the farmers exact instructions as to whether an abundance of beets may be utilized best by feeding them to the cows, the horses, or the hogs, etc.

I return to the problem of imported fodder and raise

the question how long the roundabout process will continue of sending American corn to Denmark as fodder and then to England in the shape of bacon. It would seem more natural that this finishing process should go on either in America or in England. Still more peculiar is it that butter produced by the aid of American oil cakes is exported to America. We hope that Denmark will continue for many years to find this transaction profitable, and especially is it of great importance to our many small farmers with from five to twenty acres. They buy proportionally very great quantities of fodder and have therefore much more live stock than their own fields permit, and for them in particular it would be a great loss, if this finishing industry should cease to be profitable. One of the causes of their peculiar state is of such a kind that we do not hope it will last forever, namely, the difference in wages due to the irregular distribution of the population between the new and the old countries; and in time, as immigration tends to equalize the density of population, we hope that wages will even be equalized. As more lasting causes I may mention the climate of England, which is favorable for grass growing, and makes that country suited to a quite peculiar kind of agriculture. Whether the climate of North America is also so different from that of Denmark that it will prove to be a permanent basis for the existing export from Denmark of butter, potatoes, and several kinds of seed, I don't know at present. But I hope to learn it during my journey. Our neighbor country, Sweden, has in its southern districts natural conditions for about the same kind of agriculture as Denmark, but as they have import duties on grain, the development has been rather slow. Some think that their duties have therefore been a doubtful advantage to the Swedish farmers, while others say that two countries with the

Danish system would be too much. And this is probably valid. Denmark delivered before the war 40 per cent of England's import of butter and 50 per cent of its pork, and likewise we bought a considerable part of the cotton-seed cakes of the United States; the market would therefore have been much less profitable, if Sweden had adopted the same system.

Our leading export articles, butter and bacon, are also the main basis of our coöperative system, which probably is the most famous feature of Danish agriculture. It was in the eighties of the last century that the first coöperative dairies and slaughter-houses were erected. The advantages of these are not only technical, in that the farmers use separators, steam, etc., but also commercial, in that the united farmers get a better price for wholesale quantities than did the single farmer coming to the merchant or manufacturer with his little parcel. Against our sugar factories, which are not coöperative, the farmers have tried to secure the same advantages by organizing beet-growing associations, but this has not succeeded nearly so well.

When the first coöperative dairies were erected, skeptics said that they would drown in balderdash and hubbub, as formerly the private dairies, who bought milk from several farmers, drowned in fraud (diluted milk). But the skeptics were wrong; coöperation became not only an economic success, but also a spiritual success, having increased moral and mutual confidence. The farmers can easily agree, watering of milk is rare. The milk is paid for according to the percentage of butter-fat, and the hogs are paid for according to their weight and quality when slaughtered; while the private packing companies used to pay according to the live weight. The farmers did not trust in these matters the private accounts, which they could not control; but in

the accounts of their own coöperative slaughter-houses they had complete confidence. Some of the slaughter-houses buy not only hogs, but also cattle, old horses, etc.; and as the value of such animals is sometimes rather difficult to settle, the farmers under the old conditions might feel a grievance for some time after such transactions, believing that the slaughter had not paid them enough; but now they are content.

Here in America I have found that you are interested especially in coöperative marketing. Well, when our farmers produce together, they also sell together; co-operation only for marketing we have for some smaller articles, such as eggs, seed, and potatoes. For eggs a great coöperative export society was started in 1895, but only 25 per cent of our eggs are sold on coöperative terms, while the corresponding figures for dairies and slaughter-houses are 83 per cent and 66 per cent. Nevertheless, coöperation has been of great importance for the egg trade, having raised the moral standard. Before that time, in the autumn when the production decreased and the prices increased, the farmers kept the eggs a week or two, the wholesale dealer kept the eggs another week, the retail dealer a third week, and finally the eggs arrived in England in rather bad condition. But in a few years coöperation succeeded in raising the standard of the egg trade in its own field as well as in private business.

Older than the coöperative dairies and slaughter-houses are the coöperative stores (coöperative societies), of which the oldest was established in 1866. But not until the dairies were spread over the country, did the stores become of great importance. In contrast to other countries, these stores are mostly in the country, parallel with the other coöperative movements, and their turnover is often so small that the advantage of having

them is less in the surplus earned than in the fact that the people of the district have a store. The members feel under obligation to buy in their own store, and therefore the turnover becomes sufficient, altho still small; but if they had a private merchant in the village, they would too often buy in the town. Only in the last ten years have the coöperative stores become of importance amongst the laborers of the towns, but now they are growing rapidly; and at the same time the coöperative house-building associations have attained great importance, stimulated by the housing scarcity during and after the war. These two coöperative movements of the towns often make the friendly arrangement of having the coöperative stores located in the houses of the building societies.

Older than the dairies are also the savings banks of the farmers, of which the oldest date from the fifties. Some of them are located in the towns, but nevertheless have farmers on their administrative boards. These are often rather large, while the greater number in the country have a single parish or some few parishes as their district. These savings banks are not really coöperative loan societies like the German Raiffeisenkassen; for the responsibility and the formal authority is not with the borrowers. But in fact they function as loan societies, for the board feels a friendly obligation to assist the farmers with smaller loans; and therefore they have had great importance for the development of agriculture. For the dairies and the slaughter-houses, also, they have been very useful, as in the eighties it would probably have been difficult to borrow sufficient money for their erection, if the only lenders had been the banks and savings banks of the towns. We are always quicker to understand the new possibilities in our own field than in foreign fields; furthermore, the leading citizens of the

towns at that time were afraid of issuing loans to the farmers, on account of the bad times in agriculture; and finally, they were influenced by the political opposition between town and country, which at that time was very sharp. It was therefore very fortunate for the farmers that they were not dependent upon the people of the towns, but could borrow the money in their own institutions. For the small coöperative waterworks of the villages, the electric plants, the building societies, it has been very useful to have their own savings banks. Later on the farmers established so-called coöperative banks, which assist the dairies, etc., with their payments, and do other banking business.

Coöperative also, in their formal organization, are finally the so-called credit associations, through which the farmers, as well as the owners of real estate in the towns, have obtained about one half of all mortgage loans (and we have very heavy mortgages). They are unions of borrowers, subject to joint and several liability, and giving loans up to 60 per cent of the value of farm and live stock, with amortization in about 60 years. The loans are given in bonds, which the debtor must sell at the current market price.

If in the definition of coöperation, stress is laid on the fact that it is a union of weak persons, our credit associations are not coöperative, because many of the greater owners of estates and of the greatest landlords of the towns are members. But in all other respects they are coöperative, and it has proved very profitable for the owners, that the mortgage institutions are governed by the debtors and not by the creditors. Thus, in the nineties, when interest was low, the possibility of converting the old loans into issues with a lower interest rate was utilized with much more energy than probably would have been shown under any other system. The only

dark spot in the system is that it has been so easy to get large loans, that before the war (1909) the average mortgage of our farmers was 43 per cent of the value of farm and live stock, including private loans and loans from other institutions. In Germany the average mortgage indebtedness was only about 25 per cent, and so also it is here in America. Only in Sweden is the percentage about the same as in Denmark.

Our Scandinavian neighbor countries have established institutions of the same kind but not with so great success. They say that they have not the same spirit for coöperation as the Danes. In other fields, also, it has appeared that the Danes are very inclined and fitted for united work. Our labor unions included before the war a higher percentage of the laborers than in any other country; our employers also have strong unions; the laborers have an excellent organization of sickness clubs, and unemployment clubs. Our house tenants and landlords are organized. Even our students at the university are organized, having a board which confers with the professors about the wishes and complaints of the students. (I often have had very pleasant talks with the board, and I have invited them when I wished to learn the point of view of the students.) Our business men, from the greatest to the smallest, are very inclined to pools and agreements of all kinds. Thus the bakers of Sealand in 1911 made an agreement beginning with these words: "This agreement is valid for all bakers in Sealand, even if they are not members of the union." It is not German discipline that compels us to march together; it is the natural feeling of the population.

I am not quite sure that this coöperative spirit is wholly a symptom of strength. When, for instance, here in America the trade unions are much weaker than in Denmark, it is possible that one of the causes for it is

that your laborers have more feeling of personal responsibility, and are more affected by the personal struggle to raise themselves in the community and utilize the rich opportunities of the country; while the Danish population has more class feeling, more of the feeling that progress is reached together with one's comrades. Your spirit is probably more strengthening to personality and character, and more of a stimulus to the desire for saving. And our class feeling can develop into class egoism. But perhaps our coöperative spirit is nevertheless a step in the direction of more perfect social status and an indication of a higher moral maturity. If you here in America wish to imitate our coöperative system, you must remember this difference in the spirit of the two nations. And in other points, also, our conditions are more favorable, namely, that the rural districts are more densely populated, and that finished animal products are rather dominant in our agriculture.

You may ask, whence have we got this coöperative spirit. Perhaps the system of "common property," which formerly prevailed in Denmark and many other countries, has developed it. As regards the last 50 years I would especially call your attention to the "Peoples High-schools," where the sons and daughters of the farmers from 18 to 25 years take a course of 5 months in the winter or 3 months in the summer. They give no degrees or certificates. The teaching is mostly by lectures, whose purpose is to influence the pupils in spiritual directions; the subjects are history, religion, literature, science, geography. In addition to two or three lectures a day, there are classes in reading, grammar, arithmetic, drawing, etc. The schools are attended by about 4000 young men and 3500 young women, almost exclusively from the rural districts.

The coöperative spirit in the United States may de-

velop merely through coöperation itself; just as your trusts have attained more of public spirit, as competition was weakened. Your coöperative marketing, again, may develop into coöperative production; just as private merchants sometimes proceed to produce articles which they formerly bought, or to sell finished products in place of raw materials. The strength of the German Syndikaten shows how important it is to combine in selling.

Finally, let me tell you about the Danish small farmer. One half of all Danish farmers must be regarded as small farmers, having only five to twenty acres each. The larger holders among them live exclusively on this little area, while the smaller also get cash wages from larger farmers, working for instance three days a week at home and three days for others. The coöperative institutions have accepted them on rather fair terms, and have been even more favorable to them than to the ordinary farmers. Now they get the same price for their butter as the larger farmers, tho they separately could not produce the same quantity; and even if they did, they could not get the same prices. As to the constitution of the dairies, we have the principle: One man, one vote. In some dairies it is "the cows who vote" not the men, but only in a very few. And so long as the above-mentioned roundabout way of sending American grain to England via Denmark is profitable, the small farmers especially will develop this agricultural industry to the highest possible degree.

The total number of small farmers is nearly the same as the number of ordinary farmers, — about 80,000 of each, — but their share of the soil is of course much smaller, so that we can say, that in Danish agriculture the predominant element is the middle-sized farmers, who in many respects resemble the American farmer.

But the number of small farmers is increasing at the rate of about 1000 a year, and there is a great so-called hunger for land, a great agitation to accelerate the distribution of land through the aid of the government. This hunger exists amongst the small farmers themselves, who wish more land, or wish that their sons may get the same position as independent farmers as they themselves have; and it exists also amongst the agricultural laborers, of whom, however, there are comparatively few.

The efforts of the Danish government to accelerate the subdividing began in 1899, with a law by which small farmers can borrow at low interest nine tenths of the value of the improved farm; and about 500 of the above-mentioned 1000 new farmers every year are due to this grant. The other half is due to private efforts, and the area of their holdings averages more than the 10–12 acres which is the average size of the farms established by the aid of government loans. This law is still in force, but in 1919 we adopted another law, ordering the subdividing of the parsonages and of a certain part of entailed estates. This land is sold through the state or the state church to the farmers at a yearly payment, that varies according to the value of the land. This institution is a combination of lease and ownership, but is called ownership; the occupier can sell the property like an ordinary owner, but the annual payment cannot be annulled. The average area of these is greater than the holdings of the first-mentioned farmers. This new principle of a rent, which is similar to a government tax, and which varies according to periodic valuations, is a step in the direction of Henry George's single tax, which is the final ideal of a great number of our small farmers. They think that through this tax it will be easier for those who have only a little capital to get land, and more

difficult for people without ability to retain their land. I think that they are right on these points, but that the effect will be very slight.

The most eager of our agitators deny the right of existence of the large farmers, and believe that the final objective is to get all large farms subdivided. In this there is an element of truth: the old division of labor between large and small farms ought to be altered a little in favor of the small ones; we have many very able small farmers, while those who are rich enough and able to administer an estate have been engaging more and more in the business life of the towns. But we still have a great number of very able large farmers, and it is impossible to get all the land of the country sufficiently utilized without the aid of the ablest large farmers, the ablest middle farmers, and the ablest small farmers; we want them all.

Danish agriculture is the leading trade of the country, furnishing 90 per cent of our export. This gives a certain self-congratulation which is sometimes exaggerated, but has a moral value. On one of our experiment stations, which I sometimes visit, I have received the impression that the young men working in the fields have a feeling of responsibility towards the fatherland, and do their work with national enthusiasm. In other trades, also, we can find this feeling, especially in those which have reached the state of export. But nowhere is the feeling of being coöperators with the fatherland so strong as in agriculture.

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REVIEW

INCOME IN THE UNITED STATES[1]

THERE can be no doubt that these volumes will form a landmark in the progress of statistical research, and that all future investigators in the field of National Income will take them as their guide and chart. Volume i is semi-popular, and, after describing in outline the methods employed, exhibits the principal results. Volume ii is for serious students, statisticians, and other experts, and in it are examined in detail the data on which the estimates depend. In Number 3 Mr. Knauth rearranges the materials as far as possible under the different states, and after some bold estimates, distributes the total income among them. This number ought not to be used till volume i and ii have been examined, since knowledge of the definitions and methods of computation and approximation employed is essential to its proper understanding. Number 3 by itself would suggest an accuracy in measurement which is quite candidly not claimed in the main work.

There is a serious danger that the public will accept these estimates as firmly established and certified by the ablest and most trustworthy statisticians of the United States. The cover itself suggests that many very difficult problems are solved; on it we find: "Some of the questions answered are: What has been, year by year, the aggregate income of the nation? . . ." It would perhaps be more accurate to read, "questions asked" for "questions answered." The authors exhibit for the most part a studied caution, and in general

1. Income in the United States: Its Amount and Distribution, 1909–19, by the staff of the National Bureau of Economic Research. Volume i, Summary, pp. 1–152; volume ii, Detailed Report, pp. 140. Distribution of Income by States, by Oswald W. Knauth, pp. 30. (Numbers 1, 2, and 3 of the National Bureau of Economic Research.) New York, published by the Bureau.

distinguish between what is established by evidence and what is guessed; but even they are sometimes inclined to let their desire to obtain a complete statement overcome their knowledge of the insufficiency of materials. The most conspicuous instance of this lapse from grace is in the treatment of The Distribution of the National Income (vol. i, chap. 3). This rests on Mr. Macaulay's analysis (vol. ii, part 3). Mr. Macaulay gives a very scholarly treatment of the problem, of great interest to students of method, and points out how completely insufficient is the material. "The method finally used has . . . practically all the weaknesses of the data from which it has been constructed. . . . The final results are probably not quite so bad as they might have been." In the end he compares the problem to the discovery of "what song the Syrens sang" (p. 425). Under these circumstances it would have been prudent to postpone the publication of the estimate, or to bury it in volume ii, under Mr. Macaulay's mathematics.

This criticism is put in the foreground because popular writers and speakers are likely to be more interested in the inequality of distribution of income than in its total. In England a lot has been heard of such a phrase as x per cent of the population absorb as much as y per cent of the income. Tho there is every reason that the facts should be known, whether they are pleasing to us or not, it is inadvisable that very doubtful estimates should be given currency, whether they make for complacency or for discontent.

The estimates of the total of National Income are on quite a different footing. There is little doubt that reasonable accuracy has been obtained in the principal statements, and that this accuracy can be improved in further estimates on the same lines, as information accumulates. The weak points in the calculation are clearly pointed out and their importance is appraised. It seems probable that the total of income, as defined by the authors, has been ascertained within ten per cent of the fact, and this is as high a precision as has been reached in the best estimates for other countries. Perhaps too much emphasis is laid on the closeness of the agreement be-

tween Professor King's estimate by the Sources of Production and Mr. Knauth's by Income Received, for both draw from the same material for a considerable part of the total. Mr. Knauth [2] uses the statistics of Agricultural Production for his estimate of farmers' income; the two authors estimate the value of houses owned by occupiers from the same data; a quite considerable part of "Unclassified Industries and Miscellaneous Income" (vol. ii, chap. 19), a heading under which from one third to one quarter of all income is grouped, is in fact computed from incomes, but is included under the estimate of Production. This overlapping is unavoidable, — it is present in the similar comparison made in the British Census of Production, 1907, — but it helps toward agreement in the results, and any error present in the estimates of such groups is present in both totals. (See Tables I and II below.)

Before examining the details, it is well to consider the definition of National Income. "The National Income is taken to consist of the commodities and services produced by the people of the country or obtained from abroad for their use, with the omission of goods for which no price is commonly paid, for example, the services of housewives" (p. 42). Surely there should be subtracted payments abroad for shipping services and interest due abroad in the estimate based on production (as done by Professor Lehfeldt in *The National Resources of South Africa*, 1922); while the value of payments from abroad should be added.

The most difficult question is the treatment of direct taxation. The present writer, when discussing the question of the definition of the National Income for the United Kingdom (*Economic Journal*, March, 1922), recommended that a distinction should be made between National Income and Social Income: Social Income = consumption and saving in the year = aggregate of individuals' incomes (as ordinarily reckoned . . .), less incomes received from compulsory reductions for no services or for services not rendered in the year in question

2. Besides the authors now named, Professor Mitchell has taken a great part in the work, and the whole is issued on the responsibility of the Directors of the National Bureau, who have examined it critically.

(old-age pensions, soldiers' pensions, interest on the national debt)." The outcome of the discussion on pp. 50 ff., vol. i, is somewhat on the same lines. If taxes are spent on valuable services, they should not be deducted if these services are rendered in the year of account; where they are rendered in previous years (as in loans to the government), the question is left open, apparently in the hope that the taxes deducted before assessment of incomes (p. 49) will make the answer unimportant. In the estimate by Production all reported business taxes have been deducted in reckoning the product. In the English Census of Production in 1907 they were included. Which method is correct? The theoretic discussion offered is incomplete, and the decision reached, "that taxes which are added to selling prices should, and that taxes which are not added should not, be deducted from the value product," is open to serious criticism; for the value of the goods to the consumer may be held to be what he pays for them, and remain so if they have been subject to a tax, whether or no the producer has consciously added the tax. If the consumer enjoys a taxed cigar and also the free services of the officials for which the tax pays, both cigar and services may be accounted income, and also the commodities which the official consumes. It is evident that the question requires very careful analysis. The authors admit that on the balance too much is deducted in the Sources of Production Estimate, and are doubtful whether the deduction is too great or too small in the alternative estimate; but, if this is so, what has caused the close agreement of the two estimates? The sums at issue are by no means small, and this haziness in definition is serious numerically.[3]

In the estimate by incomes there is no doubt that savings are included if they are made out of money actually received; but the savings resulting from undistributed dividends (Corporations Surpluses) are not included, and quite rightly a sum is added (see Table I) for this. The difficulty is not one of definition if the surplus corresponds to goods produced, but

3. It is not clear how far taxed articles are included in the index numbers of prices. It is in this direction that allowance can be made to correct the treatment of the estimates.

arises in the estimation of the amount, in the deduction of losses and the proper allowance for depreciation. A further difficulty, which is necessarily only partly surmounted in the estimates, is to decide what part of appreciation or depreciation of national property ought to be included.

In Tables I and II are exhibited in summary form the principal results of the two investigations. For the estimate by Production the principal data are drawn from the Censuses of Production for the years and industries to which they relate. Information on this firm basis accounts, however, for only about half of the total income; for the remaining half bold estimates have been made from imperfect records of many kinds. For Construction the data "are more or less unsatisfactory" (vol. ii, p. 103); for the Hand Trades generally the investigation "has not produced results of any high degree of reliability." The estimate of the value produced by government activities rests on income of employees, and the results are "rather rough approximations" and rest on "rather reasonable assumptions" (p. 213). The calculation of income in the "Unclassified and Miscellaneous" group, in which one third of the whole income is included, has a very slight statistical basis.[4] Nevertheless it is not improbable that the total has a fair accuracy, for two reasons: (1) Numbers of sources of information have been collated in many of the groups, and after critical and well-informed study have been forced to yield the modicum of positive facts they contain. So much knowledge of the nature of the material and of the general circumstances in each case is needed, that outside criticism is not possible, but there is much evidence that the work has been very carefully done. (2) The relative error in the total is probably less than would be expected, since it depends on the aggregation of a great number of unbiased separate errors, most of them of small magnitude, which tend to compensate each other.[5]

4. In Column D of Table 19a, *Thousands* is printed instead of *Millions*.

5. See vol. i, p. 61. It may be pointed out that the formula for the *standard deviation* of the total does not depend on any assumption of the "normality" of the distribution of the errors; and even if we introduce the term *probable* error, we need not assume normality in the items if (as in this case) they are numerous and independent.

TABLE I.—1913

(billion dollars)

Estimate by production		Estimate by incomes	
Agriculture	5.9	Personal Incomes:	
Mineral production	1.2	Tax Exempt	.8
Manufacturing:		Farmers	4.2
Factories	8.0	Others over $2000	9.0
Construction	1.7	Others under $2000	18.3
Other hand trades	.8	Corporate surplus	1.0
			33.3
Transportation:			
Railways, etc.	2.3		
Street railways, etc.	.8		
Telegraph, etc.			
By water	.3		
Banking	.5		
Government	1.8		
Unclassified and miscellaneous	12.3		
	35.6		

TABLE II

	Estimates of total (billion dollars)				Per capita	
	By production	By incomes	Final	Purchasing power at 1913 level	In dollars	At 1913 price level
1909	$28.8	....	$28.8	$30.1	$319	$333
1910	31.8	31.1	31.4	32.2	340	349
1911	31.2	31.2	31.2	31.7	333	338
1912	33.6	32.4	33.0	33.2	346	348
1913	35.6	33.3	34.4	34.4	354	354
1914	33.9	32.5	33.2	33.0	335	333
1915	36.1	35.9	36.0	35.2	358	350
1916	45.4	45.5	45.4	40.7	446	400
1917	53.9	53.9	53.9	40.8	523	396
1918	60.4	61.7	61.0	38.8	586	372
1919	....	66.0	....	....	....	....

For the estimate by Incomes the most important evidence is obtained from the Income Tax Returns, tho in 1913 these only accounted for less than a third of total income and for a much smaller proportion of the numbers of incomes. In more recent years the proportions are higher, but the problem of estimation is more difficult owing to the variation of prices. It is necessary to turn to other sources to ascertain the bulk of incomes and to account for all persons "gainfully employed." We must presume that somewhere the incomes of unoccupied persons drawing dividends — gainfully unemployed — are included. The bulk of non-tax-paying income is wages, and no doubt the best possible use has been made of the incomplete records of wages in the United States. The whole of the investigation is full of difficulties, and so much approximation is necessary even for the major items that the reader feels a lack of security in the whole structure. If the amount of incomes of all persons with over $2000 a year can in fact be known with fair precision, and if the *number* of incomes of less than $2000 is known, then, with any reasonable estimates, the possible error in the computed total may be reduced to moderate dimensions. But there is so much in the nature of not very firmly grounded guesswork and of uncertain records in the cases of taxable income, and of the whole number of persons concerned, that the resultant possibility of error is very difficult to ascertain. The ground is admirably surveyed, and if the records of income and of wages improve and consecutive statistics are available on an unchanged basis, it will be possible in future years to fill in the details with confidence. Meanwhile, all that can be safely said is that the estimate cannot be disproved.

A considerable part of the computation has necessarily been accomplished by interpolation between the full records for particular dates. To those unfamiliar with this class of work it may appear that a considerable extra hazard is involved; and since so much space is given to an examination of the material for these supplementary series, the second volume may suffer in reputation; but in fact there is in most cases very little margin for the introduction of error in this

way, and the intermediate results are of the same order of precision as are those more definitely ascertained. The movements shown in Table II are even on a surer basis than the actual totals, since whatever errors there are tend to apply in the same sense to all the years. The elimination of price changes is, of course, somewhat hypothetical; but the general result, that real income per head did not increase between 1909 and 1914 and increased only 11 or 12 per cent between 1914 and 1918, appears to rest on good evidence.

To the table of comparative incomes (vol. i, p. 85) might be added Professor Lehfeldt's estimate for South Africa,[6] that in 1914 the income per head of the white population was very nearly the same as in the United Kingdom. In this table figures for other countries are converted to dollars at par, and the per-capita income for the United States is found to be 38 per cent greater than in the United Kingdom; the internal purchasing power, however, is believed to have been greater in the latter country and the effective difference was probably less than 38 per cent.

The various statements which compare income from labor and from profits in different groups of industries indicate that the relation is much the same in all those countries for which estimates exist. The change in this relationship and other changes in relative distribution during the war years are exhibited in several tables (e. g., vol. i, p. 99), and the results are very interesting.

ARTHUR L. BOWLEY.

6. The National Resources of South Africa, p. 24.

NOTES AND MEMORANDA

THE AGRICULTURAL CREDITS ACT OF 1923

THE Agricultural Credits Act of 1923, which became law in the closing days of the 67th Congress, is an omnibus measure. It includes in its forty-three pages two parallel systems of agricultural finance, extends the life of a third, contains important amendments to a fourth, and, one might add, to a fifth, since the Federal Reserve System is so largely concerned with agricultural credits. The Act is an amalgamation of no less than five bills dealing with the subject, namely the Lenroot-Anderson bill, the Capper bill, the Strong bill, the Harris bill, and the McNary bill. For good measure, the substance of the McLean Concurrent Resolution was added. The amalgamation was effected mainly by tacking the five bills and the joint resolution end to end, with only a slight effort to smooth off the joints.

Title I of the Act contains in amended form what was originally known as the Lenroot-Anderson bill. This bill originated with the Joint Commission on Agricultural Inquiry, of which Senator Lenroot and Congressman Anderson were joint chairmen, and which has produced a series of valuable reports upon agricultural questions. It is designed to supply an avenue through which the farmer can obtain "intermediate credits," so-called because they are said to be intermediate in point of time between the long-term loans obtainable on farm mortgages and the short-term credits available through banks. The precise scope of this field of intermediate credits has not been defined. To the forefront in the discussion have been loans upon breeding herds of live stock, loans to finance the erection of fences and silos and the acquisition of farm machinery, loans in connection with planting of orchards,

construction of irrigation ditches, and similar enterprises which are not seasonally self-liquidating. The theory of the Lenroot-Anderson bill was that loans of this character had no proper place in a bank of deposit, but would form more properly the basis for short-term investment securities. Provision is therefore made for the organization of twelve "Federal Intermediate Credit Banks," owned and managed by the United States Government, and authorized to rediscount agricultural paper, with a maturity from six months to three years, for banks, live-stock loan companies, and credit companies, and to make direct loans to coöperative marketing associations. Upon the security of the paper thus discounted or rediscounted, the Intermediate Credit Banks are authorized to issue tax-exempt bonds to the amount of ten times their capital and surplus. (The initial capital is $5,000,000 for each bank.)

The success or failure of this system will obviously depend on two factors: first, the amount of paper of the type contemplated which will be offered to the Intermediate Credit Banks; and second, the extent to which the demand can be met through the issuance and sale of bonds. What amount of business will be offered it is difficult to foretell. Much will depend on the rate of discount which the banks will establish and on their requirements as to security. So far as concerns the amount of securities which can be sold even with tax exemption, it is easier to foresee difficulties. The bill was seriously criticized, even after it has passed the Senate, by Secretary Mellon, on the ground that it was completely lacking in safeguards from the point of view of security, and was in this respect unsound and dangerous. The difficulty is perhaps an inherent one. Ditches and fences and silos do not afford a satisfactory basis of security for a loan. At best, the farmer can give a second mortgage upon his land. Nor has any method yet been devised by which live-stock loans can be safely made at more than a year's maturity. It is generally found prudent to limit them to six months. It seems unlikely, therefore, that any large volume of securities can be sold upon the basis contemplated.

Title II of the Act contains provisions taken from the Capper-McFadden bill. This bill represented in general what the War Finance Corporation had found to be desirable in the way of permanent legislation. Its most important feature was an attempt to set the business of live-stock financing upon a sounder basis. This business is conducted in large part by loan companies, organized under state law and operating as discount houses for live-stock paper. Into the operation of these companies serious abuses had crept. Indeed, improper financial practices, no less than price deflation in the live-stock industry, brought a large number of them on the rocks in the distressed years of 1920 and 1921. The Act as passed embodies the provisions of the Capper bill permitting live-stock loan companies, with a minimum capital of $250,000, to incorporate under federal charter, and to operate under the supervision of the Comptroller of the Currency. There are strict limitations as to the amount of indebtedness which such a company may incur in relation to its capital, the security which it may take, and the character and size of loans which it may make. They are subject to examination by federal authorities in the same manner as national banks; and provision is made for maintenance of adequate liquid reserves. In addition, the corporations are authorized to discount paper secured by nonperishable agricultural commodities, properly warehoused.

These federally chartered loan companies will deal directly with ranchmen, farmers, and coöperative marketing associations of farmers. In addition, however, there may be organized, presumably in the larger financial centers, federally chartered rediscount corporations, with authority to rediscount agricultural paper either from the primary loan companies above described, or from banks which are members of the Federal Reserve System. These rediscount corporations will be in a position to act as a channel for the distribution of live stock or commodity paper among banks and other investors in the financial centers.

Title III of the Agricultural Credits Act contains important administrative changes in the Federal Farm Loan System.

The original Farm Loan Act authorized the organization of Federal land banks under a temporary management, appointed by the Federal Farm Loan Board; but it contemplated that in course of time the management would be transferred to a permanent organization controlled by the borrowers. During and after the war a substantial amount of farm loan bonds was purchased by the United States Treasury, and provision was made that as long as these bonds were retained in the Treasury the temporary organization, under government control, should be continued. Title III of the Agricultural Credits Act embodies a compromise between the two forms of management, in that it provides that three directors of the Federal land banks shall be appointed by the Farm Loan Board, three by the borrowers, and one by the Farm Loan Board out of three candidates nominated by the borrowers. In addition, this title increases from $10,000 to $25,000 the maximum of loans by a Federal land bank to any one borrower, and contains other amendments in matters of administration and detail.

Another part of the original Capper bill is embodied in Title IV of the Agricultural Credits Act. This title amends the Federal Reserve Act, with a view to liberalizing the terms upon which agricultural paper can be discounted by Federal Reserve Banks. In recognition of the longer turnover of agricultural operations in some parts of the country, agricultural paper is made eligible for rediscount with a maturity up to nine months, instead of six months as in the present law. Agricultural bankers' acceptances are made eligible with a maturity of six months, instead of ninety days as in the present law. Some technical difficulties standing in the way of rediscounting paper of agricultural marketing associations are swept away, and such paper is given the status of agricultural paper. This title also contains the substance of the Harris bill, reducing to 60 per cent of the present figure the minimum capitalization necessary to render a state bank eligible for membership in the Federal Reserve System.

Title V of the Act embodies the McNary bill, extending until March 31, 1924, the time during which the War Finance

Corporation may make advances for agricultural or export purposes. While the new business which is being handled by the War Finance Corporation has fallen off sharply with easier money conditions throughout the United States, the extension will permit the Corporation to serve as a backlog to the other agencies created under the Act, until these have been set in motion.

This title also contains the substance of the McLean Concurrent Resolution, providing for the appointment of a joint Congressional commission to ascertain why more state banks and trust companies have not entered the Federal Reserve System, and what measures can be taken to bring them into the system. It was brought out in the committee hearings which preceded the adoption of the bill, that whereas 11,326 state banks and trust companies are legally eligible for membership in the Federal Reserve System, only 1,648 state banks and trust companies have availed themselves of the privilege.

Since the Act contains such a variegated assortment of measures, generalizations about it can be of little value. It is worth observing, however, that the fear, often expressed, that the law will promote an unhealthy inflation in agricultural districts, is probably unwarranted. The federally chartered loan companies provided for in Title II of the Act will be private institutions, subject to conditions of supply and demand in the money markets in the same manner as existing loan companies. The only difference will be that they will be operated upon a sounder basis than the live-stock loan companies now conducting the same operations. As to the government-owned Federal Intermediate Credit banks, it should be observed that the government capital placed at their disposal is limited to $60,000,000, and that any additional funds must be raised through the sale of debentures. That a sufficient amount of such debentures could be sold to the investing public to contribute substantially to a movement of inflation is highly improbable.

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A CATASTROPHE IN THE BRITISH BUILDING GUILDS

SINCE the appearance, in the issue of this Journal for November, 1922, of an article by the present writer on the first two years' work of the building guilds of Great Britain,[1] the guilds — and, to some extent, the guild movement in general — have fallen on evil days. The present status of the building guilds may be summarily indicated by the fact that on January 30, 1923, following the appointment of a receiver to administer the Guild's affairs, the district court at Manchester gave its sanction to an agreement under which the National Building Guild, with the exception of the London, Bournemouth, and Scotland organizations, passes into the control of a building contractors' firm of Glasgow, to be retained by the latter for a period of three years, subject to certain conditions presently to be described. In tracing the events leading up to this rather catastrophic decline in the fortunes of the guilds, the writer will endeavor to resume his discussion from the points at which it broke off in the previous article, and so preserve the continuity of the story.

Lack of working capital has been the bane of the building guild movement almost since its inception, and it was the factor which ultimately — tho not without the assistance of other conditions more directly under the control of the Guild administrators — resulted in the appointment of a receiver to carry on the work of the Guild, pending a permanent settlement with its creditors and a readjustment in its organization to meet future conditions. As related in the previous article, the Coöperative Wholesale Society, early in the spring of 1922, fearing competition with its own building department, refused further accommodation from its bank to the guilds on all contracts other than those involving the "basic sum" or

1. "The British Building Guilds: a Critical Survey of Two Years' Work." Quarterly Journal of Economics, November, 1922, pp. 75–133.

basic estimate, according to the terms of which the overdraft or loan available for the Guild at the C. W. S. bank was secured by the payments falling due each week from the Ministry of Health. This in itself would not have proved sufficient to wreck the credit of the guilds, were it not that soon afterwards the Ministry of Health declared that all contracts in the future, to receive its sanction, must be of the "lump-sum" type, and that no further contracts of the "basic-sum" type would be considered.[2] Inasmuch as under the new form of contract the provision of weekly payments was to be discontinued, the Coöperative Wholesale Society refused to extend to the guilds further accommodation on any of their contracts, thereby depriving them of their chief source of financial support.

This unfortunate chain of circumstances did not, however, leave the guilds wholly without resources. In the first place, they had at their disposal certain sums accruing to them under the national loan, which were not entirely absorbed by the plant being erected at Paddington. Certain of the guilds, moreover, had accumulated small surpluses from contracts previously completed for the government; where these were not swallowed up by payments for continuous pay or loans to other guild committees, they were, presumably, available as working capital. Finally, the National Federation of Building Trades Operatives came forward at this juncture and agreed to lend to the Guild £40,000, this sum to be obtained by a levy of one halfpenny per week on each of its members. It was to this end that the arrangements for the transfer of engagements of the London and Manchester societies to the National Building Guild were expedited, so that a special resolution of amalgamation was adopted at Manchester, March 20, 1922, to take effect as from April 1, altho the actual deed of transfer was not completed until a later date. The guilds

2. As the writer understands it, the "basic-sum" form of contract involves a basic estimate of labor and material costs, and of overhead charges, but it does not include the stated percentage allowed for plant and maintenance, and the fee of £40 paid the contractor as his profit. Presumably in the "lump-sum" form of contract the prime costs, overhead charges, expenses of plant, etc., and the amount available for profit are lumped together in a single sum, on the basis of which the tenders are considered and the contracts awarded.

may be said at this time to have reached the critical stage in their existence, and their fortunes from this point on, barring the intervention of some untoward event, might equally well have been favorable or unfavorable.

The fates seem to have conspired, however, that the building guild movement in Great Britain should be short-lived. Shortly after the amalgamation had taken place, the Council of the Building Trades Parliament decreed a reduction in the wages of all workers in the building industry. This caused a reaction in the workers' attitude toward the proposed levy in support of the National Building Guild, with the result that the proceeds of the loan of the Building Trades Federation, from April to November, 1922, amounted to only £11,000, a sum totally inadequate to rescue the guilds from the difficulties which were now threatening to overwhelm them. Receipts from the funds contributed by the trade-unions were so slow coming in, and the total amount received was so small, that the Guild was soon compelled to resort for accommodation to a joint-stock bank in Manchester. The building guilds outside of Scotland and the London area were then — to use the dramatic phrase affected by the Guild Socialists — "in the grip of the capitalist bankers."

In the meantime events not less significant in their import for the future of the guilds were taking place in London. It will be remembered that the London Guild, prior to its amalgamation with the Manchester society, had succeeded in raising nearly £12,000 by loan from one source or another. More than half this amount had been raised by Mr. Sparkes personally from individuals who were interested in the work he was developing and had confidence in his ability to carry the enterprise through to success. It was but natural under the circumstances that he should be concerned at the difficulties in which the London organization, through its affiliation to the building guilds at Manchester and elsewhere, was rapidly becoming involved. By May it had become evident to all who had eyes to see that the forced loan of the Federation was destined to prove a fiasco. Confronted with the immediate necessity of finding additional credit to finance their opera-

tions, the London guildsmen approached the C. W. S. bank in London, from which they were still receiving accommodation, with a view to obtaining an extension of their overdraft. They were told by the manager that, altho the Coöperative Wholesale Society was quite willing to consider a further overdraft on their accounts, to be secured by the weekly payments falling due under basic-sum contracts still to be completed, the Society could not do this so long as the accounts of the London Guild were legally merged with those of the National Building Guild. The implication of this was plain enough: as a separate legal entity the credit of the London Guild was considered good; as an integral part of the National Building Guild organization it was not so considered, and the guildsmen were told as much in so many words.

A conference was at once sought with the national secretary, Mr. S. G. Hobson, and a plan of reorganization was drawn up, under which each of the ten Regional Councils was to become a separate legal entity for carrying on the work of the guilds, with the National Board organized as a coördinating agency in the form of a self-supporting industrial society. To facilitate the repair of the London Guild's credit, an immediate rescission of the deed of transfer was proposed, and request was made for a conference on these matters as soon as possible. Repeated efforts to secure the national secretary's opinion of the plan, and to bring it before a national conference of the guilds for discussion and settlement were without result. Finally, on June 18, at a conference of the London Regional Council and the National Emergency Committee,[3] Mr. Hobson agreed to forward to the London Guild, for its immediate use, £415, with the understanding that the question of reorganization was to be postponed for the time being. At this time the contracts on hand of the London organization amounted to very nearly £600,000, and the credit required for carrying out these operations was estimated at £24,000. The National Board did not then have, and had no expectation of getting, the necessary amount to carry the London Guild

3. The National Emergency Committee is, or was, the standing executive committee of the National Building Guild, responsible to the National Board for its actions.

through while it remained a part of the National Building Guild. The obvious course would have been to sever the connection between the two and thus enable the former to secure its promised accommodation from the C. W. S. bank. This Mr. Hobson did not choose to do. Instead, he had the matter of reorganization referred to a joint committee, whose decision was to be binding on the London Regional Council, and offered allegations at the meeting to the effect that the London salary list was too high and must be cut down.

The joint committee appears to have met but once, and at this meeting none of the parties concerned in the dispute were examined and no evidence was taken. The probable decision of the committee was discussed, but the meeting adjourned without having drafted a final report, and the work of doing this was left with Mr. Hobson. On July 10, a report was made to the London Regional Council, and in it the resignation of the entire staff of the London office was demanded, refusal to resign involving immediate dismissal for any of the individuals concerned. Charges were set forth in the report stating that the administration of the London Guild was "too elaborate, too costly, too ambitiously organized." No reliable evidence in support of this allegation was offered and no attempt was made to compare the London Guild's record of 2½ per cent of total turnover for administration expenses (including those of area committees) with similar records of other Regional Councils.[4] The staff of the London office saw no reason, on the face of their record, for resigning their positions, and this they refused to do. On July 13 they were dismissed from the service of the Guild, and two days later the guild committees of the London area, as evidence of support of their leaders' principles, passed resolutions approving the proposed plan of regional decentralization by an overwhelming majority. On July 17 the demand of the deposed officers

4. It is significant to note that, altho the report was profuse in its allegations of mismanagement and extravagance on the part of the London officials, it did not offer recommendations of an eminently practicable nature to remedy such a state of affairs. Its proposal for a reduction in the salary list and staff of the London office would, in the possible saving effected, be counterbalanced by the resultant distribution among the area committees of most of the work of survey, tendering, purchasing, and finance, which latter would entail duplication of effort and multiplication of costs.

for a full inquiry into the matters at issue was refused, and their connection with the National Building Guild ceased from this date. They did not, however, abandon therewith all their efforts to maintain a successful and independent Guild organization in London, and we shall return to their further work later on.

It was no one's fault but their own that the guilds did not fare well while "in the grip of the capitalist bankers." Possibly two thirds of the local committees administered their affairs in a wise and efficient manner; the remainder were guilty of a variety of offenses, and guilty in varying degrees. Slackness in discipline and general administration was perhaps the commonest abuse of local autonomy. A small minority of the committees were lax in enforcing the rules as to time-keeping, and in administering the funds for continuous pay. One conspicuous instance is recorded in which the members of a guild voted themselves a full day's pay while they were in attendance at a horse-race. A number of committees were inclined to regard their housing contracts as a solvent for the nation-wide problem of unemployment, and hired men beyond their capacity to utilize them economically. Labor on Guild contracts was becoming less efficient; or, at least, labor on private contracts was becoming more efficient, spurred on by the swamping of the labor market with thousands of unemployed men. The inevitable result was a disproportionate rise in the cost of labor, with the effect that money which should have been spent on materials was not available for that purpose at all. Unpaid bills began to accumulate and local banks refused to renew or extend loans which they had already made.

Confronted with the pressing need of finding additional credit, the delinquent committees applied to their Regional Councils and to the National Board for assistance. Nor were they alone in asking for such aid. A number of committees which had come into being only under the régime of "lump-sum" or "maximum-sum" contracts found difficulty in financing themselves over the initial stages of their work, and they, too, called upon the Manchester office for help. Where

the resources of the latter were not drawn upon in helping newly organized committees to get on their feet, they were being demanded by other committees, which had neither the will nor the ability to stand on their feet, once they had got there. If the local committees had been left free to struggle along as best they might, with their credit facilities limited strictly to the several Regional Councils, the chances are that the crisis which the Guild now faced might never have been brought about.

The passion for centralized control which seems to have governed the actions of the leaders at Manchester, however, determined the course of events otherwise. The extraordinary demands made upon the credit of the Manchester Guild necessitated an overdrawal of its accounts. Creditors by this time had become uneasy and pressed for an immediate payment of their bills. The joint-stock bank did not find this state of affairs to its liking and requested an immediate settlement of the Guild's loans. This failing, it registered a debenture and shortly foreclosed, with the result that in November a temporary receiver was appointed to administer the Guild's affairs. This threatened to mark the end of the National Building Guild, and such may yet prove to be the case, but a large firm of building contractors in Glasgow, whose head is reputed to be a Socialist, became interested in the Guild's sad state and volunteered to rescue it from total extinction. Negotiations were set under way, and an agreement was finally arrived at under which the Scottish concern engaged to lend to the Guild £50,000 at 6 per cent per annum, on the condition that a representative selected by it should have full control of the Guild's operations for a period of three years, at a managerial fee of 6 per cent of the net profits. Creditors were to receive 10*s.* on the pound in payment of their accounts — a much better settlement than they could have expected without the intervention of a third party. As already stated, this agreement was sanctioned by the court on January 30, 1923; but at the date of this writing (March, 1923) the Scottish concern has yet to take any steps toward fulfilling its part of the contract.

What the exact future of the building guilds in Great Britain will be is for the moment difficult to predict. Certainly the longer the legal proceedings now in process are protracted, the dimmer become the hopes of the Guild's ever recovering the position it once held in the building industry. Two large contracts have already been lost, and work is constantly slipping away from the guilds that they might otherwise have undertaken. The matter of liquidation has been postponed for the time being, but this is solely for the benefit and at the instance of the creditors, who have nothing to lose, and considerable to gain, from the fulfillment of the contract with the Glasgow concern. It was also planned that the guilds in London and Scotland should separate from the National Guild, assuming the liabilities, assets, and contracts in their respective districts, and register as independent societies; but inasmuch as they are still legally a part of the national organization, and as the affairs of the latter have yet to be "wound up," their work is for the moment at a halt. Fortunately for itself, the Builders' Guild of Bournemouth never became formally affiliated to the National Guild, and its work, including contracts to the value of £16,000, is now proceeding without interruption. Perhaps this instance is suggestive of what regional decentralization in the building guild organization might have accomplished, if only the remedy had been applied soon enough.

A number of developments outside the National Building Guild, but within the building guild movement, must not be lost sight of. The officers of the London organization, after having been expelled from the National Guild, set themselves to organizing what, in their own words, should be "a non-monopolist organization of independent and self-governing guild contractors based upon the trade unions and technical associations of the building industry." Their enterprise seems so far to have met with considerable success. "Guild Housing, Limited," as the new concern in London is called, was registered as an independent industrial society on September 12, 1922. By the end of the year it had in operation at Acton Vale a moderate-sized builders' plant with all the necessary

machinery installed for turning out in finished form its own lumber, joinery, and wood-work. The new Guild organization has already completed houses at Hampstead and Brighton, and has numerous others in prospect. Its work so far has been somewhat hampered by lack of working capital; but toward a goal of £20,000 on loan stock paying 6 per cent interest, it has already succeeded in raising about £5,000. Like the former building guilds, the new concern pays the full standard rate to its workers, plus "continuous pay" during bad weather and holidays, altho it has not yet devised a scheme of sickness or accident pay.[5]

This new venture in guild organization is virtually a co-operative building enterprise, jointly owned and controlled by the builders of houses and the persons who are to occupy them. The two governing bodies corresponding to these functions are: (1) the building council, composed of not less than three nor more than twelve representatives elected by the operative, technical, and administrative staffs of the society; and (2) the housing council, composed of an equal number of representatives elected by the subscribers to Guild Housing bonds, which will presently be described. These two councils exercise jointly the right of electing new members to the society, but the function of management is apparently left with the administrative officers appointed by and responsible to the society at large. Each member holds a transferable share, of the nominal value of one shilling, which entitles him to a vote at the meetings; but no member is entitled to more than one vote, whatever his financial interest in the society may be. The shares thus held do not bear dividends, all surplus earnings being applied, after provision has been made for continuous pay, to the payment of interest of loans, to the reduction of their principal, or to the investment of additional capital in the business. Working capital is secured by the issue of the 6 per cent loan stock mentioned above, and by the sale of Guild Housing bonds in denominations of £10, paying 4 per cent interest. Subscribers to the latter, providing their number is sufficient, ballot for the occupany of the

5. Continuous pay in the National Building Guild has been discontinued except on those contracts where work is proceeding strictly according to schedule.

houses from time to time, as they are completed by the society. Each £10 bond entitles its holder to one chance in this lottery for houses; payment may be made in full at the time of completion or, as is usually the case, may be extended over a period of from ten to twenty years. To provide additional working capital, each house, at its completion, is mortgaged to the full amount, the society acting as mortgagor. The writer confesses to considerable misgivings as to this method of finance, but judgment on this point must be reserved.

The guildsmen at Manchester have started a Guild building society broadly similar to the one just described, but inasmuch as it differs in a number of important respects from the building guild proper, and as the future of the latter is at the moment extremely dubious, the time may be considered appropriate for an appraisal of the building guild experiment and a brief indication of the lessons to be derived from it. In the first place, it is undeniable that the building guilds were ushered into being under most favorable auspices. The housing shortage in Great Britain provided the guildsmen with an opportunity for putting their theories into practice which is never likely to occur again. They were pitted against rivals of mean capacity and, so far as can be learned by an outsider, were not discriminated against by the government; indeed, they enjoyed the benefit of quite generous terms in their housing contracts. From their own account, they suffered primarily from lack of working capital; but the writer believes that a factor no less fundamental — and to some it may appear more so — as a cause of their downfall was maladministration and inefficiency. The reasons for this opinion will appear as the discussion proceeds.

The guilds received a decided set-back from their rebuff at the hands of the Coöperative Wholesale Society and the defection of the National Federation of Building Trades Operatives in their promised loan. It was as a result of this that they were compelled to seek accommodation from a joint-stock bank. But such a state of affairs is hardly synonymous with disaster. The chief trouble with the building guilds from

this point on is that, being constituted as a single legal entity, they had to be mutually responsible for each other's solvency, since the downfall of one meant the collapse of the entire structure. Such a burden proved too great for a young organization, constituted, as was the National Building Guild, of local units exercising a considerable degree of autonomy in the conduct of their affairs. Had it not been that the leaders at Manchester were obsessed with the idea of a Guild monopoly, and, with this end in view, were resolved at all costs to maintain a single centralized organization responsible for credit and finance, to bind the whole together, the local guilds might early have found salvation by cutting loose from the main movement or by breaking up into a number of regional organizations. This would have placed the responsibility for credit and finance exactly where it belonged, on the local bodies, and would have left the more efficient units free to develop without the burden of maintaining their less efficient and less worthy fellows. The experience of the London Guild lends weight to this assertion. In brief, the disease afflicting the National Building Guild was one of centralized responsibility and decentralized control. Of the two, it would probably have been more prudent, under the circumstances, to abandon the former; but the prepossessions of the doctrinaire leaders of the movement dictated otherwise.[6]

Maladministration, therefore, accounts in large measure for the downfall of the building guilds. Yet there is a more underlying cause than that of simple organization, and that is the misconduct of the guild committees themselves. Apart from the abuses of continuous pay and democratic control which have already been mentioned,[7] it is evident that a large number of the committees, perhaps a majority, failed to main-

6. It is undoubtedly true, as the Guild Socialist (February, 1923) takes pains to point out, that with a decentralised organisation it would have been impossible to finance anything like the volume of work that was finally undertaken; but it is equally true that the successful financing of a small volume of work is infinitely preferable to the unsuccessful financing of a large volume of work.

7. Regarding continuous pay, it is interesting to note that, in some cases, owing to the payment of State insurance benefits, trade-union benefits, club benefits, and the like, the workers in the guilds, being in receipt of continuous pay as well, were paid more when not working than when they were on the job. Such cases, however, were confined to a very small number of the Guild workers.

tain their favorable showing in respect to labor efficiency, as compared with the private contractor, when the incentives ordinarily operating in private industry returned in full force. This is admitted by the leaders of the movement.[8] The labor of the guildsmen, let it be understood, did not become absolutely less efficient; it simply failed to improve sufficiently to maintain its favorable relation to labor on private contracts. Without attempting to dogmatize on so moot a point as this, we may say that, as human nature now is, the motive of service does not appear to act as a more powerful incentive to labor than the more orthodox motives generally connoted by the terms "self-interest," "fear of starvation," "self-preservation," and the like. In what degree the altruistic tendencies in man are innate, and to what degree they may be developed by modifications in the economic and educational environment, are questions beyond the scope of the present discussion.

The building guild experiment may not have fulfilled the hopes of those who have hailed the guild movement as a sovereign remedy for the conflict between labor and "capital," but it is, at least, not without significance for American employers of labor. Labor and "capital" can never become successful partners in carrying on production until they are each given the status of partners. The ideal community of interests which is supposed to be inherent in the productive process can never be realized until labor and management are each given an equal voice in determining the conditions under which they are to coöperate. If the experience of the building guilds has made clearer the possible ground of cooperation between these two parties in the future, it surely has not been altogether in vain.

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8. Cf. the remarks of Mr. S. G. Hobson, at the National Guild Conference of December 9, 1922, as quoted in the Guild Socialist for January, 1923: "The Guild's undoubted superiority in output, as well as in quality of work, had given it a sort of monopoly. . . . [But] the fear of unemployment had enabled the private employer to drive his employees to an extent which had not been practicable before. The Guild monopoly in respect of output had disappeared." There is good reason for believing that the guilds maintained their high quality of workmanship to the last in nearly all cases.

THE UNIQUE POSITION IN GREEK TRADE OF EMIGRANT REMITTANCES

In the report of the National Bank of Greece for the year 1920, the Governor called attention to the recent increase in its bank deposits, by comparing the figure of 186,000,000 drachmas (dollar parity, about 5.18 drachmas) in 1911, with that of 1,191,000,000 drachmas in 1920. He attributed this expansion "to a large extent to remittances for [should read *from*] America representing savings of Greeks in that country. In fact, the remittances during 1920 of Greeks settled in the United States effected through this bank reached the sum of about 840,000,000 drachmas."[1] To a minor degree the international worth of Greek currency accounts for this large amount, since the average annual dollar rate in Athens for telegraphic transfer on New York was 5.18 drachmas in 1911, and 9.55 drachmas in 1920. Another reason can be discovered in the large earnings of shipowners, traders, and financiers in Greece from 1914 to 1920. Most important of all, however, is the fact that the high level of income in the United States and a period of high prices for confectionery, fruit, restaurant diet, flowers, and shoe-shines, afforded huge savings in America, which were transmitted in large measure for the private economy, largely family savings, and the national economy, largely patriotic loans, of the Hellenic kingdom.

To appreciate the significance of these remittances in the international balance-sheet of Greece, let us consider first the country's "favorable" and "unfavorable" national balances; then attempt to visualize the national and international value of this single kind of "invisible" money transfers. For our purposes, the period 1913–20 is satisfactory.

For any country with a population numbering a few thousand or more, no one pretends that even an approximately accurate balance of payment record can be devised. Certainly

1. Commercial and Financial Chronicle, vol. 112, p. 2617.

in the case of Greece, where there is scant interest or little reliance accorded figures of any kind, the probable errors loom large. Yet, as the writer knows from first-hand observation, there is every indication that the flow of Greek-labeled remittances from the United States to the mother country is never-ceasing, widely distributed with reference to both countries, and of impressive size. Perhaps the best general picture of the situation can be noted by citing herewith a calculation by a group of leading Athenian banking houses early in 1919 forecasting the requirements of the kingdom for that current year.

GRECIAN INTERNATIONAL BALANCE-SHEET, 1919
(figures in millions of drachmas)

Export of Exchange	
Merchandise	880
Exchange necessary for military purposes	100
Interest on loans	40
	1020
Import of Exchange	
Merchandise	560
Remittances from residents abroad	150
Freight charges	225
Tourists and miscellaneous sources	25
Unfunded balance	60
	1020

It is pertinent to note that during 1919, when commodity prices soared everywhere while the drachmas kept at or near par in terms of the dollar, an outstanding political and military event — the landing of the Greek troops at Smyrna on May 15 — together with heavy speculation in merchandise and in depreciating foreign currencies, contributed toward unexpected increases both in importations of goods and in overseas savings. An augmentation in the last-named item can be attributed in part to enthusiastic contributions on the occasion of fresh action against the Turkish forces. In 1919, the merchandise imported amounted to 1,608,000,000 drachmas, nearly twice the estimate, and the remittances by Greek

nationals in America amounted to 350,000,000 drachmas, an increase of 130 per cent over calculations. Moreover, it took no account of remittances through any domestic financial agency other than the National Bank of Greece. The average exchange rate in 1919 was 5.54 drachmas to the dollar, which would give an equivalent figure of $63,000,000 for transmitted savings made in America. Without question this figure is an understatement, since in 1913 the figures of the Greek Ministry of National Economy credited this bank with only 29 per cent of that year's total; while estimates secured personally would indicate that since 1918 a proportion of 75 per cent of the total would not be prejudicial to the National Bank.

There are pronounced difficulties in arriving at the foregoing or other estimates. One large American financial house has reported that, despite its large business in remittances to Greece, it can give no worth-while estimates because numerous transfers are made through bills payable in other currencies. The drawer frequently is fearful of a drop in drachma exchange during the time that the draft is *en route* to final destination. Considerable sums of money are sent loose in letters (Græco-American money-order business has been suspended since the middle of 1918). Cash and credit transfers take numerous forms.

Irrespective of the exact amount of these remittances, abundant testimony exists regarding the thrift of the American Greek. Typically, he comes to America to make money and returns to Greece after he has reached his goal. This is evident by the American immigration figures covering the year 1921, when only 115 out of 13,450 immigrants returning to Greece were American citizens, altho over 50 per cent of them had been in America a minimum of ten years. The American Greek engages in trade rather than industry, which makes possible an avoidance of unemployment and at the same time enables him to reap the rewards of a large turnover on a small capital outlay. Despite the fact that approximately half of our immigrants from Greece are married, few of them bring their wives. What Foerster says of Italians in America, that their savings represent "too extensively the

surpluses of individuals not supporting families abroad" [2] is doubtless somewhat less conspicuous in the case of the Greeks. Yet the leading cause remains that which Marshall indicates: "a few people save for their own sakes; but the chief motive of saving is family affection." [3] Regardless of the location of their families, their savings are greater than their needs for bare subsistence. The Greek in America works hard for long hours, spends little, and maintains a consistent record for large savings, partly to be explained by an income based upon high wave-level and expenditures harking back to a low-cost native diet. Thus a conservative estimate of $125 to $175 per capita annual net saving for the 400,000 to 450,000 Greeks in the United States does not seem at all unreasonable, while the aggregate amount, $50,000,000 to $78,750,000, mostly remitted to Greece in the form of immigrant savings, stands out clearly.

That these private savings constitute a real source of strength to Greece cannot be doubted. For the United States, transactions of this kind continue to have far-reaching importance.[4] To Greece they mean strength to the state, as well as bread, olives, cheese, and wine for the inhabitants. For the Greek banker, they are an index more carefully watched than the American banker notes the amount of unfilled orders on the books of the United States Steel Corporation. It must be so, since during the period following the Armistice of 1918 they have unquestionably exceeded the adverse balance of trade arising from non-military requirements.

From the standpoint merely of money totals, a correlation between public finance and remittances is interesting. In 1913, the budgetary estimate of receipts (with no greater and perhaps no less pretense to accuracy than most national budgets) amounted to 312,000,000 drachmas, distributed as follows: loans, 140,000,000 drachmas; extraordinary revenue (mainly hoped-for income from annexed territories) 48,000,000 drachmas; and total ordinary revenue, 124,000,000 drach-

2. The Italian Emigration of Our Times, p. 503.

3. Marshall, Principles, 7th ed., p. 228.

4. J. H. Williams, Review of Economic statistics, July, 1922, p. 207, gives $600,000,000 as the combined immigrants' remittances and relief for 1920.

mas. The total estimated ordinary revenue consisted of direct taxes, 21,000,000; indirect taxes, 54,000,000; stamps, dues, and monopolies, 36,000,000; miscellaneous, 13,000,000.

For the year 1913, the Greek Minister of National Economy reported that Greeks in the United States sent back 92,000,000 drachmas. Thus the money transfers from the United States were equivalent to a prospective 74 per cent of total ordinary public receipts and 30 per cent of total public receipts. In actual performance, the total receipts amounted to 201,000,000 drachmas, the total expenditures to 254,000,000 drachmas, so that the remittances from Greeks in the United States were equivalent to 46 per cent of the total public receipts and 36 per cent of the total public expenditures. Expressed in another way, these invisible imports were nearly twice as large as the government deficit for the year 1913. Remittances from America through the National Bank alone amounted to 27 per cent of the public receipts and 20 per cent of the public expenditures in the year 1919; and to 57 per cent of the public receipts and 38 per cent of the public expenditures in the year 1920.

Turning now to the international accounts, there is food for thought in comparing these same remittances with Grecian trade exports and imports, with the excess of trade imports, and with the imports from America.

SELECTED INTERNATIONAL FIGURES[5]

(in million drachmas)

	Merchandise exports	Merchandise imports	U. S. Remittances through National Bank of Greece	Adverse merchandise balance	Imports from America
1913	119	178	29	59	3
1914	122	179	33	57	21
1915	142	170	46	28	111
1916	110	238	51	129	235
1917	113	223	61	110	110
1918	297	734	115	437	86
1919	726	1608	350	882	445
1920	683	2135	840	1452	478

5. In preparing these figures, official Greek returns are used. "Imports from America" may be considered as mainly those from the United States. Dollar exchange quotations, taken from American consular reports were as follows: 1913, 5.20; 1914, 5.19; 1915, 5.355; 1916, 5.21; 1917, 5.18; 1919, 5.54; 1920, 9.55 drachmas. Until 1920, the drachma had a reputation for remarkable steadiness in world money markets.

After a careful study of Grecian finance and trade, the writer believes that for present-day typical averages, it is not unreasonable to take foreign-commerce figures for the period 1914–17, inclusive, and remittance figures for the period 1917–19, inclusive. With allowance for past fluctuations in drachma exchange, but with a disregard for changes in price levels, it may be stated that under normal conditions the savings sent back from Greeks in the United States (1) far exceed pre-war direct imports from America; (2) far exceed the habitual adverse balance of trade; (3) probably exceed merchandise imports or merchandise exports; (4) may exceed total foreign commerce. There is probably no other case in which remittances of this kind play so commanding a part.

That the foregoing conclusions are tenable becomes plausible when the following facts are remembered.

1. In territory, resources and population, Greece's present position is not wholly unlike that of 1914. Considering the scanty resources and the low purchasing power of at least 90 per cent of the people, her pre-war import and export per-capita figures are now not out of line with those of countries which enjoy fairly similar conditions.

2. The remittances from America in 1921 exceeded the 1917–19 average. There is no indication that Greeks in America will either earn or transmit less in the immediate future.

3. The expatriated Greeks are considered to be the most thrifty among the recent types of American immigrants. Records of outgoing postal money-orders destined for Greece usually show, in comparison with other countries, the highest average amount per order.

4. Remittance figures taken from reliable Hellenic sources are, in the nature of things, not likely to be overstatements.

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